SUPPLEMENT.

The Mining Journal,

RAILWAY AND COMMERCIAL GAZETTE:

FORMING A COMPLETE RECORD OF THE PROCEEDINGS OF ALL PUBLIC COMPANIES.

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THE IRON INDUSTRIES OF SOUTH WALES.

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The South Wales mineral basin is second in importance of all the coal areas in Great Britain, with a superficial area of upwards of 900 square miles, and extending through the counties of Pembroke, Carmarthen, Glamorgan, and Monmouth, its greatest length being 75 miles from Pontypool on the east to St. Bride's Bay on the west. Carmarthen Bay divides the coal field into two unequal portions, that to the east having a range of 56 miles, while the portion to the west has a range of 17 miles, the greatest transverse diameter in the meridian of Neath being 16 miles. This great coal tract has a vertical thickness of strata associated with the coal measures of 11,650 ft., according to Prof. Hull, F.R.S., which great thickness is only surpassed in depth by that of the coal fields of Nova Scotia, and Saarbrück, in Rhenish Prussia. A great and well-defined anticlinal axis traverses the coal field east of Carmarthen Bay, thus the coal seams occupying the centre of the basin are brought nearer the surface along this line, especially from Risca, by Pontypridd, and on to Swansea Bay. The effect of the anticlinal axis is to bring the lower coal within reach, otherwise it is doubtful if the coal occupying the centre of the basin could ever have been wrought but for this upheaval. The coal measures of the South Wales mineral basin repose principally on the Millstone Grit; westward, however, of Swansea Bay the Millstone Grit disappears, and the lower coal measures rest upon the carboniferous or Mountain Limestone; this in turn disappears at Haverfordwest, where to the west the coal measures lie directly upon the Lower Silurian rocks.

The character of the coals of this great coal field vary considerably in their chemical composition; the seams occupying the north-east side of the basin are mainly coking or partly bituminous; those to the north-west are anthracitic. Again, on the south side of the basin the seams are bituminous or gaseous, while the seams in the centre of the basin are known as semi-bituminous or steam coals. In the Aberdare area the seams are of that kind known as free burning and smokeless, hence their great importance for steam purposes, especially the Aberdare Four-feet steam coal, which is now nearly exhausted.

Prof. E. Hull, F.R.S., in his "Coal Fields of Great Britain," gives 25 as the number of coal seams in this coal field of 2 ft. thick and upwards, or an aggregate thickness of 84 ft. of solid workable coal; the same author has estimated the resources of this important coal basin. The Royal Coal Commission report estimates the total quantity of coal available to a depth of 4000 ft. as 32,456 millions of tons, making due allowance for working, faults, bad coal, &c. The quantity of coal available below a depth of 4000 ft. is estimated, after the necessary deductions, at 31,783 millions of tons; this may never be realised. Dealing with these enormous quantities, and taking the production of this great basin at the present time, we may assume that sufficient coal still remains, at our present rate of consumption, to last us for 2300 years.

This great coal field, with its vast resources of coal, and possessing all the advantages of an extensive seaboard, with several first-class ports, and traversed throughout by numerous railways, is especially favourably situated for the development of mineral and metallurgical enterprise; the ores of foreign countries and our colonies are here largely imported and smelted, and around Swansea, Neath, Llanelly, and other places are centred some of the most extensive copper, lead, silver, zinc, and other manufacturing works in the kingdom; indeed, Swansea has been designated, and not inaptly, the metallurgical capital of Great Britain. The important influence exercised by the above-named industries will render interesting a general account of the coal produced in this area, and its distribution, followed by analyses of some of the principal seams of coal, after which we will consider the occurrence of the more important ironstone measures and the production of ironstone.

PRODUCTION OF COAL IN SOUTH WALES.—In the year 1856 the production of the South Wales coal field, including Pembrokeshire, Carmarthenshire, and Glamorganshire, but exclusive of Monmouthshire, amounted to 5,400,000 tons, increasing in the year 1860 to 6,254,800 tons, and in the year 1863 to 6,917,081 tons; the produce of the following districts, in the last named year, were—

Districts.	Quantities.
Merthyr ..... Tons	812,778
Gellygaer	639,055
Aberdare	2,148,960
Llanwonno	293,288
Rhondda Valley	328,000
Lower end of Taff Vale, Llantwit Vardre, &c.	141,000
South outcrop to Neath	655,000
Neath and Vale of Neath	305,000
Swansea and Swansea Valley	517,000
Glyncorrwg	86,000
Pembrokeshire and Carmarthenshire	1,041,000
Total	6,917,081

The very complete returns published annually by the parochial authorities of the parishes in Glamorganshire, of Aberdare, Gelligaer, Llanwonno, and Ystradyfodwg, in adjusting the assessment to the poor, are so valuable, showing the progressive increase, that we give the total quantities raised in each parish since the year 1864:—

Year.	Aberdare. Tons.	Gelligaer. Tons.	Llanwonno. Tons.	Ystradyfodwg. Tons.
1864	2,048,472	764,521	—	428,489
1866	2,185,571	866,895	395,051	649,828
1868	2,054,509	807,424	361,921	981,787
1870	2,070,920	909,911	415,536	1,332,059
1871	1,836,954	962,946	346,825	1,325,037
1872	2,013,718	1,067,959	395,594	1,555,853
1873	2,054,879	1,078,347	425,731	1,940,766
1874	1,963,141	1,227,477	438,081	1,947,916

A perusal of these parish returns show that while the production of Aberdare parish has remained tolerably constant since the year 1864, that of Gellygaer has increased upwards of 60 per cent., and Ystradyfodwg upwards of fourfold during the same period.

Following up the production of this district since the year 1864, exclusive of Monmouthshire, we find the quantities recorded as follows in the reports of H. M. Inspectors of Mines, and side by side for comparison will be found the production of Great Britain in each of the same years:—

Year.	South Wales.	Great Britain.
1864 ..... Tons	6,948,000 ..... Tons	93,122,419
1866	9,376,443	100,728,881
1868	9,000,000	104,566,959
1870	9,299,772	112,875,725
1871	9,120,000	117,439,251
1872	10,131,725	123,497,316
1873	11,473,152	128,544,000
1874	11,452,358	124,590,108

Of the coal produced in South Wales in the year 1874 we find the number of persons of all ages employed in the output amounted to 51,513, against 45,474 employed in the year 1873, distinguished as follow:—

	1873—No. of persons.	1874—No. of persons.
Underground	36,316	41,684
Aboveground	9,158	9,829
Total	45,474	51,513

The proportion of production in each of the same years of South Wales to Great Britain being 9 and 11 per cent. respectively.

COAL EXPORTED FROM SOUTH WALES.—Fully 50 per cent. of the coal raised in the district under consideration is sent coastwise to other ports of the United Kingdom, and exported to foreign countries; by far the largest quantity is shipped at Cardiff, being conveyed to that port by the Taff Vale Railway. The following statement shows the shipments from Cardiff since 1864:—

Year.	Coastwise. Coal.	Coke.	Foreign. Coal.	Coke.
1864 ...Tons	839,569 ... Tons	1737 ... Tons	1,481,657 ... Tons	5,032
1866	889,353	2189	1,837,181	11,672
1868	819,133	1301	2,099,707	9,848
1870	810,684	855	2,301,741	2,694
1871	860,028	1101	2,060,138	9,949
1872	933,328	4123	2,589,575	9,826
1873	963,818	2004	2,604,155	14,267
1874	837,369	775	2,932,800	9,396

It will be observed in the foregoing statement the little variation in the coastwise shipments, while the exported quantities show an increase nearly two-fold. Cardiff, as previously stated, is by far the most important port for the shipment of coal; for comparison, the total shipments from South Wales in the year 1873 from the various ports is given as follows, bearing in mind that the shipments from Newport is the produce mainly of the Monmouthshire extension of this great coal field:—

Ports.	Coastwise. Coal and coke.*	Foreign. Coal and coke.†	Total. Coal and coke.
Cardiff.....Tons	965,822 ..... Tons	2,618,442 ..... Tons	3,584,264
Newport	780,001	305,520	1,085,521
Swansea	256,228	556,326	812,554
Neath	192,276	48,484	240,760
Port Talbot.....	9,924	4,257	14,181
Port Cawl	91,467	6,561	98,028
Llanelly	149,956	94,314	244,270
Milford	44,475	300	44,775
Totals	2,490,149	3,634,204	6,124,353

* 3527 tons computed as coal equals 5782 tons.
† 21,807 tons computed as coal equals 35,750 tons.

Making due allowance for the small quantities of coke noted above computed for coal, we have an aggregate export by ship alone of 6,140,551 tons; deducting this quantity from the produce of 1873, we have 5,332,601 tons for consumption locally, and in the many important metallurgical industries abounding in the district; large quantities also being carried by the principal railways traversing the coal fields to the Metropolis and other places.

The "Mineral Statistics" recently issued for the year 1874 enables us to give an account of the quantities of coal and coke sent coastwise to other ports of the United Kingdom, from the ports of South Wales, and exported to foreign countries in that year, as follows:—

Ports.	Coastwise. Coal and coke.	Foreign. Coal and coke.	Total. Coal and coke.
Cardiff .....Tons	838,144 .....Tons	371,259 ....Tons	1,209,403
Newport	685,898	2,942,196	3,628,094
Swansea	256,636	510,745	767,381
Neath	218,027	56,584	274,611
Port Talbot.....	11,881	4,707	16,588
Port Cawl	98,152	9,964	108,116
Llanelly	127,989	96,466	224,455
Milford.....	33,785	395	34,180
Total.....Tons	2,270,512	3,992,316	6,262,828

Comparing the shipments of coal in 1874 with the previous year, there is a diminution in the quantities sent coastwise of 219,637 tons, while on the other hand the exports to foreign countries show an increase of 358,112 tons. The declared value of the 3,992,316 tons exported in the year 1874 to foreign countries being 3,683,095*l.*, or an average value of nearly 19s. per ton at the port of shipment.

In considering during the same year—namely, since 1864—the quantities of coal exported from the various ports of Great Britain to foreign countries, the colonies, and Ireland, of which the following is an abstract, we find that the exports have increased twofold:—

Year.	Foreign countries and colonies.	Ireland.	Total export of coal.
1864.....Tons	8,900,872* .....Tons	— .....Tons	8,900,872
1866	10,142,260*	—	10,142,260
1868	10,967,062	2,216,899	13,183,961
1870	11,702,649	2,568,271	14,270,920
1871	12,747,989	2,593,167	15,341,196
1872	13,198,494	2,611,911	15,810,405
1873	12,617,566	2,562,619	15,180,185
1874	13,927,205	2,213,145	16,140,350

In reference to the coal exported, it may be stated that previous to the year 1850 there was an export duty on all coal shipped to foreign countries and British settlements; this duty was wholly repealed by Act 13 and 14 Vict., c. 95, from Aug. 14, 1850. The returns of exports for a few previous years will serve for comparison, to show the progressive increase since that date:—

Year.	Exports.	Year.	Exports.
1834 .....Tons	615,253	1844 .....Tons	1,754,171
1837	1,113,610	1847	2,483,161
1841	1,848,294	1850	3,351,889

ANALYSES OF THE COAL.—The seams of this great coal field differ materially, as previously stated, in their chemical composition, and it is of considerable importance that these changes should be determined by careful analyses, in order to ascertain the special purposes for which each kind of coal is most suitable, whether for steam or household purposes, the manufacture of gas, and the varied use to which it is applied in our numerous metallurgical industries. With these objects in view we have selected the following detailed analyses of some of the more important coals of South Wales:—

GLAMORGANSHIRE COALS.

	Powell's Duffryn.	Aberaman Merthyr.	Birchgrove Graigola.	Gadly's Nine-feet.	Cwmbach six feet.
Carbon	89·26	90·94	84·25	86·18	88·28
Hydrogen	4·66	4·28	4·15	4·31	4·24
Nitrogen.....	1·45	1·21	·73	1·09	1·65
Sulphur	1·77	1·18	·84	·87	·91
Oxygen	·60	·94	5·58	2·21	1·65
Ash	3·26	1·45	4·43	5·34	3·26
Total ...	100·00	100·00	100·00	100·00	100·00

Many other analyses might be given, but the above sufficiently show the composition of the coals of Glamorganshire. Following we give the yield of coke per cent. from the above-named and other coal:—

Yield per cent. of coke.		Yield per cent. of coke.	
Powell's Duffryn	84·30	Nixon's Merthyr	79·11
Aberaman Merthyr.....	85·00	Thomas's Merthyr	86·53
Birchgrove Graigola	85·10	North Duffryn	82·25
Gadley's Nine-feet	86·54	Gadly's Four feet.....	82·23
Cwmbach Six-feet	85·83	Cwmbach Four-feet.....	85·83

Of the coal seams of Carmarthenshire, the following shows the composition of the "Pimp Quart," "Fiery," and Llangennech coals:—

CAERMARTHENSHIRE COALS.

	Pimp Quart Vein.	Fiery Vein.	Llangennech Vein.
Carbon	92·17	87·68	85·46
Hydrogen.....	3·10	4·89	4·20
Nitrogen	1·08	1·31	1·07
Sulphur	·34	·09	·29
Oxygen	2·22	3·39	2·44
Ash.....	1·09	2·64	6·54
Total	100·00	100·00	100·00

Of the above, the Fiery Vein when coked yields from 79·80 to 88·10 per cent., while the Llangennech coal gives 83·69 per cent. of coke.

IRONSTONE MEASURES OF SOUTH WALES.—The principal measures of ironstones worked are found in the lower coal measures, where they are numerous and rich in their yield of iron; these lower coal measures are separated from the upper or Penllergare series by the Pennant Grit, an important arenaceous rock, which in the neighbourhood of Swansea attains a thickness of nearly 3300 ft. On the northern outcrop of the coal basin at Dowlais occurs a well-developed section of strata. In a depth of about 320 yards, from a measure known as the "Gwr-hyd Mine," at the top of the series, to the lowest measure, called the "Bottom Rosser Mine" in the lowest 100 yards of this section, are five workable seams of coal, and 62 distinct courses of ironstone, the latter varying from 1 to 5 in. in thickness; many of these are necessarily not workable. On the southern outcrop at Cefn Cwse we find another section, also in the lower coal measures, in which occur 19 seams of coal, the "rock vein coal" being the uppermost, and the "Small Cribbwr seam" the lowest; between these seams are 22 measures of ironstone, consisting of 51 distinct courses or bands, many of which, like those on the northern outcrop, are not necessarily worked.

In the central anticlinal district at Llynvi, Maesteg, and Cwm Avon occur two important seams of blackband—the upper seam, at Llynvi, consists of one course, 20 in. thick, and is separated from the lower seam by intervening strata of 22 yards; the lower seam also consists of one course, and has a thickness of 12 in. The "Coal and Mine Vein" is the lowest seam in this section, and between it and the upper seam of blackband, above referred to, are 12 seams of coal, varying from 1 ft. 4 in. to 7 ft. in thickness, and numerous important courses of ironstone. The seam of blackband at Cwm Avon does not exceed 7 in. in thickness, while at Oakwood it attains a thickness of 22 in. In a section at Cwm Avon, of 800 yards from the "Werndu Coal" to the "Lower Four-feet Coal," there occurs 19 seams, varying in thickness from 1 ft. 2 in. to 9 ft., between which there are 13 distinct courses of ironstone.

IRON ORE DEPOSITS OF THE CARBONIFEROUS AND PERMIAN SERIES.—Deposits of hematite are wrought in the carboniferous limestone at Whitchurch, near Cardiff, and at Pentyrch, at the mouth of the Taff Valley, the ore occurring in nearly vertical fissures in the limestone. Again, in the Permian rocks in the lower bed hematite ore exists, occurring locally in hollows or basins. These are extensively worked at Mwyndy, near Llantrissant, and also at the Bute Hematite Mine, near the same place. At Quay-coch, two miles north of Porth Cawl, the same kind of ore is known to exist, resting on the carboniferous limestone, and having a thickness of 5 ft.

PRODUCTION OF IRON ORE.—By far the largest part of the iron ore raised in South Wales is derived from the argillaceous ironstone of the coal measures; the hematite ore raised is considerable, but does not exceed 20 per cent. of all the iron ore raised in South Wales. It need scarcely be said that the ironstone of the district produced annually is totally inadequate to meet the requirement of the blast-furnaces of the district; on the other hand, the abundance of fuel enables the ironmaster to furnish the necessary supplies by importing rich and valuable ores from the hematite districts of the West Coast, from the Midland and South-Western districts of England, bearing a high rate of carriage, and he is further in a position to supply his wants by the favourable geographical situation of the district, which enables him to import ores from Spain and other foreign countries.

In the year 1858 the production of ironstone in South Wales, including that raised in Monmouthshire, amounted to 752,231 tons. In subsequent years we find the quantities given as follows from returns received. There is every reason to believe that these figures fall short of the actual quantities raised; however, the annual yield of the blast-furnaces, for which reliable data exist, give us the means of coming to this conclusion:—

Year.	Iron ore.	Value.
1860.....Tons	630,705	£162,431
1864	468,355	185,360
1867	501,186	131,230
1870	560,055	198,018
1872	1,247,594	744,465
1873	943,926	581,384
1874	661,616	339,578

The average value of these ores may, during 1872 and 1873, be taken all round as 12s per ton, the returns for the year 1874 giving an average value of nearly 10s. per ton. For general reference we add the details of produce as returned from the mines in 1873, which were as follows:—

District or mine.	Character of ore.	Quantities.	Value.
Briton Ferry	Argillaceous carbonate ..Tons	5,351	£ 3,210
Cyfarthfa*	ditto	60,000	36,000
Bute	Brown hematite	339	228
Mwyndy	ditto	52,816	46,745
Dowlais.....	Argillaceous carbonate.....	84,001	50,400
Amman.....	ditto	15,885	9,531
Ystalyfera	ditto	10,241	6,128
Plymouth.....	ditto	3,762	2,257
Victoria, Ebbw Vale, Sirhowey, Abersychan, Pontypool*, Nant-y-Glo, Blaina, Beaufort*	ditto	200,000	120,000
Tondu & Ogmore Col.	Brown hematite	160,000	96,000
Llynvi and Maesteg.	Argillaceous carbonate.....	20,191	12,114
	Black band and argillaceous carbonate	35,431	21,258
Gadlys	Argillaceous carbonate.....	9,085	5,451
Rhymney.....	ditto	32,079	19,247
Blaenavon	ditto	68,527	41,116
Varteg Hill	ditto	19,485	11,691
Varteg	ditto	7,960	4,776
Cwmbran	ditto	2,802	1,681
Tredegar	ditto	39,326	23,595
Ynisedwyn	ditto	8,673	5,204
Cwm Avon	ditto	7,923	4,752
Sundries*		100,000	60,000
Total of South Wales and Monmouthshire		943,926	£581,384

* Estimated quantities.

In examining the above returns it should be stated that the production of Monmouthshire is included in that of South Wales, and in the year 1873 amounted to 502,734 tons, of the value of 301,639*l.*, or an average price of 12s. per ton.

The total production of the iron mines of the United Kingdom for the year 1873 amounted to 15,577,499 tons, of the value of 7,573,676*l.* In the year 1874 the "Mineral Statistics," recently issued, show a considerable falling off. The details of production of each of our iron ore districts, as returned for the years 1873 and 1874, will be seen in the annexed statement:—

Districts.	1873. Quantities.	1874. Quantities.
Cornwall ..... Tons	31,455 ..... Tons	45,006
Devonshire	9,514	21,313
Somersetshire	46,533	41,342
Gloucestershire	199,342	171,428
Wiltshire	140,139	86,620
Oxfordshire	49,963	38,668
Leicestershire	—	2,930
Northamptonshire.....	1,412,276	1,056,470
Lincolnshire.....	420,281	463,240
Shropshire	430,725	313,959
Derbyshire	365,127	238,292
Nottinghamshire	—	228
Warwickshire	43,837	92,214
North Staffordshire	429,205	1,032,362
South Staffordshire	584,325	141,505
Lancashire	926,497	914,357
Cheshire	1,041	1,000
Cumberland.....	1,229,827	1,119,666
Westmoreland	—	504
Yorkshire, North Riding	5,617,014	5,614,323
Yorkshire, West Riding	407,388	370,960
Northumberland and Durham	123,282	122,481
North Wales	34,287	42,227
South Wales and Monmouthshire..	943,927	661,616
Isle of Man	2,768	1,144
Scotland	1,986,000	2,119,771
Ireland	138,765	140,360
Total	15,577,499	14,844,956

It is explained in the returns for 1874 for South Staffordshire that the estimated production usually given is omitted for this year, the difficulty of arriving at a satisfactory approximation being so great.

Of the hematite ore raised in Glamorganshire, the following shows the production of those mines near Llantrissant, for which returns are published since the year 1858:—

Year.	Mwyndy.	Bute.	Total.
1858 ..... Tons	12,5 0 ..... Tons	— ..... Tons	12,500
1860	29,217	—	29,217
1862	27,260	16,633	43,893
1864	50,401	13,168	63,569
1866	41,387	26,000	67,387
1868	60,660	22,875	83,535
1870	66,191	22,530	88,721
1871	58,723	24,601	83,324
1873	49,661	23,105	72,766
1873	52,816	389	53,205
1874	68,787	36,558	105,345

Hematite is also raised at Llanharry and Pentyrch, near Cardiff, the quantities in the year 1874 being respectively 3137 tons and 15,544 tons; formerly hematite was raised to a limited extent at Hendy and Wenvoe.

The ore raised at Mwyndy in the year 1873 was valued at 46,745*l.*, and in the year 1874, 41,222*l.*; the ore at Bute in the last-named year, 21,934*l.*, giving an average value per ton of 14s.

In our next notice attention will be directed to the analyses of the iron ores of this district, together with a brief account of the various foreign iron districts, from which we receive considerable quantities of ore to supplement the requirements of our blast-furnaces, with statistical details of such imported quantities, and analyses of the ores. In reply to numerous enquiries in reference to the continuation of these articles on our iron industries, the last of which (Monmouthshire) appeared in August of the past year, it may be explained that the interruption has been occasioned by the illness of the author.

DIRECT-ACTING PNEUMATIC STAMPS.—The invention of Mr. C. SHOLL, of Truro, consists, first, in the application of a combination of steam and confined air for working the stampers by direct action. The steam being used in an inverted cylinder placed over a pneumatic cylinder with a hammer shaft or head attached. He also uses compressed air, vacuum, or other motor. In using his improvements as a machine for boring deep wells, he attaches the trepan instead of the hammer shaft to the air cylinder, and as a rock drill he places the hammer on the steel jumper,

STEAM-VALVE COCKS.—The object of the inventin of Mr. JEAN MOLARD, of Paris, is to construct the slide-valves of steam or other motive-power engines in such a manner that the expansion of the steam or other elastic fluid may be varied as may be required, and the cut-off regulated by any kind of governor. The second improvement relates to valve-cocks, and consists in so constructing the valve cock that there shall always be a perfect equilibrium of pressure.

WELDING IRON AND STEEL TUBES.—The invention of Messrs. HOWARD and SUTHERLAND, of Coombs Wood Tube Works, Dudley, is an improvement on that of Mr. John Huggins, patented in 1871. As means for allowing more strips to be heated and welded in any given time, the complete set of turning up welding and finishing rolls are caused to move together across the furnace mouth. The frame carrying the set of rolls is placed upon slides or wheels, suitable means of adjustment being added. The straightening rolls are sometimes caused to move

with the set of rolls mentioned. As means for clearing the tube of scale and dirt whilst it is passing through the first-mentioned set of rolls, they place between any two pairs of rolls a scraper, by preference made like a pair of gas welding tongs, of such size as to enclose the tube tightly without reducing it in size.

Original Correspondence.

GUNPOWDER, DYNAMITE—THE RAILWAY COMPANIES.

SIR,—The Explosives Act, 1875, which came into force on Jan. 1 this year, was expected to do great things for the mineowners and working miners of this country by facilitating, where facility was needed, and regulating and controlling in the interests of the public safety, the traffic in explosives used in mines. How it will operate, practically, remains to be seen. Already from the action of certain railway companies there seems to be, in their opinion, one most essential thing left optional, that in the opinion of many mine owners and others interested in mines should have been imperatively defined. We refer to this because we understand some railway companies refuse to carry dynamite without, so far as we know, satisfying themselves of the safety in transit of the explosive so refused. We have heard that some companies actually propose to stop carrying blasting powder used in mines as well.

Now, Sir, as the railway companies have virtually the inland transit trade of the country entirely in their own hands, this resolution, if carried into effect, means embarrassment, almost paralysis to mining industry, and it becomes a very serious question, indeed, when they say they will not, under any regulation, carry this or the other explosive, especially if it has been proved by experience and experiments of the most exhaustive kind that the explosive they refuse is now necessary to the development of the trade of the country, and as safe to carry, under proper regulation, as an explosive well can be. We say it becomes a very serious question, indeed. Now, confining our remarks to industrial blasting agents, there are a few simple conditions that explosives should meet in order to make it desirable for railways and carriers to take them. We will mention two or three, such as—(1) chemical stability of composition in the explosive; (2) goodness of packing and handiness of packages (3) a good general experience of rough handling in all sorts of vehicles without accident; (4) a good general experience in the practical using of the stuff. Now, Sir, any explosive that meets conditions like these should, we submit, not be refused by those who are really the monopolists of the carrying trade of the country,

1.—Well, now, let us take gunpowder and dynamite. The chemical stability of the first is known pretty well; that of the second not so well. Let us go to official unbiassed evidence in this matter. Major Majendie said, nearly two years ago, to the Railway Clearing House Committee, that "pure dynamite (such as Nobel's No. 1) is possessed of the requisite chemical stability, and is, on the whole, safer to transport than powder packed in barrels." And the same eminent authority gave it in evidence to the Select Committee on Explosives before the passing of the Act of 1875 that the law relating to dynamite was as much too stringent as the Gunpowder Act was too lax. Dynamite, then, meets the requirement of chemical stability. Why do certain railways refuse to carry it?

2.—Packing and Packages: Dynamite as well as powder, if not better, meets all the conditions there can be required in this respect. Space will not permit us to go into this; we simply state it is so. Still some railways refuse it.

3.—A good general experience of rough handling dynamite as well powder meets all this, for many hundreds—nay, thousands—of cartloads have been carried about the country in ordinary carts and over the roughest roads without accident; and during a time of scarcity in this district two or three years ago, a number of common carts in the hardest winter season brought a quantity from Newcastle-on-Tyne to West Cumberland and to Furness without accident, but it is not desirable for ment to be sent a five or six days' journey in winter, even with the safest explosive, and to us it appears obvious, being what it is, the railways ought to carry it under properly regulated traffic arrangements.

4.—The practical using of dynamite is now as well known as that of blasting-powder in the Furness and Cleator, the South Wales, the Cleveland, the Midland, the Cornwall, and other districts; and a great number of practical men could be had from any of these parts who could tell the railway companies of their experience of it, in that it is as safe as an explosive well can be. These men open the boxes, handle and use the stuff, and hundreds of them would be willing to certify to its safety under all fair and reasonable conditions of test. Why, then, do certain railways refuse to carry it?

We do not, in making these remarks about dynamite, wish to disparage blasting-powder, except in so far as to indicate relative safety; here is blasting-powder used for ages, and when carried under proper regulations carried, on the whole, safely; here, too, is dynamite, proved by evidence which will convince all except those who refuse to be convinced that is as safe, if not safer than powder, to be carried about. Both are useful; nay, we will affirm that both are necessary to the adequate development of an important staple English trade; it is in their industrial aspects alone we consider them, although powder is used in war, where, along with guncotton, it will, we fear, be long before its use comes to an end, but dynamite is, we may say, almost purely an industrial explosive. Along with gunpowder, it meets all the requirements of mining industry, supplementing it in some localities, working side by side with it in others, and, where needed, doing work that its older and more largely used brother-explosive cannot do, or cannot do so well. When, therefore, an explosive by sheer force of its utility and proved excellence in the various points of safety that go to make up a safe explosive gets into the position that dynamite now occupies, can the railways refuse to carry it under proper regulations without injury to the industry of the country? We think not.

We believe it is no secret that the leading railway of the country is the head and front of opposition to the carriage of dynamite by rail, and that this particular railway, by its manager's evidence before the Select Committee of the House of Commons in 1874, and its attitude in this matter since, deliberatly shut its eyes to evidence showing cause why dynamite should be carried, has in effect refused to be convinced that dynamite should be carried by rail in this country. Now, we need not bring in the experience of continental railways, although thousands of cwts. have been carried by them, and our English railways have many of them carried it safely for several years, and so far have shown its safety in transit by rail. This influential company gives the tone to many others and stops the way, but the matter cannot rest here; either dynamite and powder, one or the other, or both, are too dangerous for the common carriers of the country under any regulation to carry, or they are not. We think they should be carried, and that the railway clearing-house, or some high railway authority, should take evidence on this matter of railway carriage of much-used explosives, and without panic, or wilfully shutting their eyes, and then saying they cannot see it, come to some intelligible decision on the subject of the carriage of these goods. The powder and dynamite people will, we feel assured, render all needful help, and if previous clearing-house investigations are not considered thorough enough, let fresh and exhaustive ones be made. The mining industry of this kingdom is slow to move, but it cannot allow this question of its indespensible explosives and railway transit thereof to rest where it is.

No mineowner wants to see explosives smuggled into his place, for that involves greater public risk than properly regulated traffic. What is needed is that the staple industrial explosives, such as powder and dynamite, should be carried openly and under proper regulation by the railways, at, if need be, the maximum rate of carriage that Parliament will allow to cover arrangement charges. We trust mine and quarry owners in other parts of the kingdom will take this matter up, and endeavour to get a satisfactory settlement. We none of us want to force the railways to carry an article dangerous to the public, ourselves, or our men. We believe in powder and dynamite. We have good and proved safe explosives, fit and proper to be carried by rail under suitable and practicable traffic arrangements. Believing these things we send you this letter, for which we trust you may find a place in your widely circulated Journal, where all fair differences of opinion on matters concerning and affecting mining have free expression in your Correspondence columns.

Whitehaven, Jan. 11. AN IRON ORE MINING COMPANY.

COLLIERY EXPLOSIONS.

SIR,—If within the last 14 years 10,000 human lives have been sacrificed by these dire calamities, and 30,000 dependants upon those destroyed rendered woefully dessolate and distressed from preventable causes, Great Britain can no longer deserve to rank amongst nations as foremost in philanthropy, humanity, or Christian duty.

In thus estimating numbers I fear that I am far within bounds, and in justification of the term preventable causes I fearlessly challenge all who are concerned, either at home or abroad, to deny or disprove my unabated but oft reiterated assertion, that such awful catastrophes are easily and infallibly within my own humble capacity to remedy; that the means are extremely simple and almost costless, fully borne out by God's laws and strengthened by common sense. I had reasonably hoped that my former letter, circulated widely through the *Mining Journal* of Jan. 1, would have been welcomed as a valuable New Year's gift if its contents were capable of proof. But how can such proof be given except by actual test by some of those on whom devolves the care, if not the responsibility, of human life in vast numbers?

When another fatality of this kind recurs, and a hundred more of our pitiable fellow-creatures, without a moment's warning, are blown to pieces or heaped together in one blackened mass, the usual outcry will be made; the daily and weekly newspaper press will proclaim far and wide as a lamentable fact that science has failed to devise a remedy, which is simply untrue, and to my mind is somewhat hypocritical, so long as such public writers close their eyes and ears to the appeal of individuals like myself, and also close their columns against stubborn facts, on which depend an absolute cure!

I have laboured long in this melancholy cause, and expended more than ten times my annual income to obtain justice to this class of operatives. I have throughout a period of more than 20 years disclaimed any desire for place or payment, and still my only reward is silent contempt. If you kindly insert this, and it has no better result than the past, I will not trespass on your space any more, but I will concentrate my energies and my resources to obtain a fair and impartial test of my suggestions in a foreign land, and let the odium of disregarded philanthropy rest upou those who so richly deserve the disgrace. In conclusion, I must beg your permission to repeat for the last time that if any member of those interested as proprietors or managers of collieries will arrange for a trial of my plans, I am fully prepared to prove that the remedy is certain; that it is comparatively costless; can be fully developed without extra shafts or the delay of a single day; the lives of the men secured; their health improved, and general contentment effected. If I fail to prove these things without the slightest stipulation for reward I will forever hold my peace, apologise for my presumption, and defray all expenses incurred thereby. C. COLWELL.

Southtown, Yarmouth, Jan. 12.

NOTES ON SEGHILL COLLIERY, NORTHUMBERLAND.

SIR,—Seghill Colliery is situated in the Northumberland steam-coal district, and as a steam coal producer has been continuously worked for a period of 50 years or more. Previous to this period the High Main seam had been wrought and raised at pits on various parts of the Seghill estate. The High Main seam, which produces an excellent house coal, is not altogether exhausted, and it is probable that the working of it may be resumed. Seghill estate, containing 1300 acres, belongs to the Blake family, the lessee being Mr. Joseph Laycock, of Low Gosforth. It is bounded to the north by Seaton-delaval, to the west by Cramlington and Burradon, to the south by Backworth, and to the east by Holywell Colliery.

The present Seghill establishment consists of three pits, placed in a line nearly east and west. The west pit, 12 ft. in diameter, is divided into two equal portions by brattice, the western portion having been the engine or pump shaft, but the pumps, as well as the pumping-engine, are now removed, and it is now used for raising coal from the Grey or Blake seam; the other portion of this pit is used for raising coal. The John pit, 9 ft. in diameter, about 40 yards east from the engine pit, is also used for raising coal from the Yard seam. The third pit is 10 ft. in diameter, and is used solely for ventilation, being the upcast from two furnaces—one in the Low Main and one in the Yard seam. It is the intention to erect a mechanical ventilator here, for which the situation is well adapted, both as to increase of air currents and economy of fuel.

The two principal winding-engines are each built on the lever principle, with 33-in. cylinder, 6-ft. stroke, and condensing, 20 lbs. steam-pressure. A vacuum of about 12 lbs. is obtained. Each of these engines has been about 50 years in operation, and is contained in a house of Ashlar stone. The winding-engine at the western portion of the engine-shaft is temporary, being erected in a wood house; it has two 20-in. horizontal cylinders, 3-ft. stroke, direct acting; the steam for this engine is 30 lbs. pressure, taken from boilers recently erected. An air-compressor is erected near the top of the John pit, having two 15-in. steam cylinders, 2½-ft. stroke, and two 16-in. air cylinders, 2½-ft. stroke, direct acting, and high pressure. The air is compressed to 35 lbs. per square inch, is taken down the pit, and to a length of 900 yards underground, south-east from the pit, in 4-in. pipes; it is then used as the motor for driving a pumping-engine, which has one 10-in. horizontal cylinder, 14-in. stroke; this works a 6-in. pump, 2-ft. stroke, by means of spur wheels in ratio of 1 to 2½. The water-pipes are also 4-in. diameter, the engine is capable of raising 50 gallons per minute to a vertical height of 60 ft. The whole of these pipes are joined by patent chilled flanges, making a joint equal to flanges faced in the lathe; these flanges are the subject of a patent held by Mr. W. O. Johnston, the engineer at this colliery.

The boilers which supply these engines, and others hereafter named, are 13 in number—six boilers of the Cornish type, each 30 ft. by 5½ ft. in diameter, produce steam at 30 lbs. pressure; tube, 3 ft. This tube is made in seven lengths of plates; these are joined together by six expansion rings; these rings are arched in the middle, and rivetted to the tube-plates at their sides, the several tube-plates being made about 1 inch apart. This forms what is known as the "Bowling expansion ring." These boilers are filled with Hessen's oscillating bars in each flue, and with Stokely's anti-primer on each steam dome; they are covered with Broughton's non-conducting composition, closed over with cement. This composition is used for the steam-pipes and the cylinders of the winding-engines. Seven other boilers are of the cylindrical form, produce steam at 20 lbs. pressure, 30 ft. in length, 6 ft. to 7 ft. in diameter. The old boilers will gradually be replaced by those of the Cornish form, and supply steam to the condensing engines. The new boilers supply steam to the underground engines, four in number. The steam-pipes are 10 in. in diameter to the yard seam, below that 9 in. in diameter. The boilers are fed by the air-compressing engine during the day, but there are other sources that can be made available for this purpose, in case of need. It should be observed that the air-compressor is only put in operation in night time.

UNDERGROUND ENGINES.—One hauling-engine in the Low Main seam near the pit has two 23-in. horizontal cylinders, 4-ft. stroke, geared in ratio of 1 to 2, two drums for main and tail ropes. This engine at one period brought coal from Burradon Colliery to the west over a plane about 1½ mile in length. As the coal in this district is worked back to a great extent the engine is not at work now, and the hauling is done by horses. The pumping-engine at the foot of the John pit replaces that formerly on the surface; it has two 18-in. horizontal cylinders, 3-ft. stroke, working direct two 7-in. pumps on Armstrong's principle, having two clacks and double action. The engine was made by Bells, Goodman, and Co. recently; it is adapted and is now in preparation to be used as a hauling engine as well as pumping, the drums being 4½ ft. diameter for main and tail ropes on the second motion. This engine now forces water to the surface—a height of 450 ft.; the main pipes are 6-in. diameter and 2-in. thick at the bottom, and 7½-in. diameter and ¾-in. thick at the top. There are two hauling-engines in the Yard seam near the pit—one has two 18-in. horizontal engines, 3-ft. stroke, geared as 1 to 2½, with two drums 4½ ft. diameter for main and tail ropes. It hauls on a plane 1760 yards in length west from the pit, 1200 yards of this is practically level, having slight rises and falls, where a fault is met, downthrow; the remaining 560 yards dips west about 1 in, in a yard; a train consists of 45 wagons, each carrying 8 or 9 cwts. of coal. The second hauling-engine has two 14-in. cylinders, 2½-ft. stroke, geared as 1 to 2½, two 4-ft. drums, working on the main and tail rope principle; it hauls from the south-east district from the dip, a distance of about 600 yards at present. The distance hauled was formerly 1500 yards or more, which is now to this extent worked back.

UNDERGROUND WORKINGS.—There are three seams worked at Seghill Colliery, all them producing steam coal—the Blake seam, 6 ft. in thickness, at 35 fms.; the Yard seam, 2½ to 3½ ft. in thickness, at 48 fms.; the Low Main, 4 to 5½ ft, in thickness, at 75 fms. The output of coal is about 1400 tons in a day of ten hours with three winding-engines. The Yard seam and Low Main seam are worked on the bord and pillar system, the pillars left being 30 by 16 yards. The system of mixed lights is in use, safety-lamps being used for pillar working only. These cannot be classed as in any way dangerous from fire-damp, as carbonic acid gas is emitted, and at times explosive gas when the mercury is low. The Yard seam is worked on the long-wall method, with candles; a face of 200 yards or more is being worked at. The gateways are made about 16 yards apart. This seam is well adapted from its height and other conditions for this system of working. The only machines in use for working coal or stone are two of McDermott's for boring in post or sandstone, and three of Ainsley's for boring in shale or coal, principally in the former.

The erections on the surface have been remodelled during the last two or three years. There are 16 screens (constructed of iron with steel bars), supported by metal columns and covered over by wooden sheds. The fitting shop contains one lathe, one vertical drilling-machine, one screwing-machine—all made by Hind and Son, Nottingham. These are driven by an engine with 15-in. horizontal cylinder, 2½-ft. stroke, and a new boiler adjacent to it at 30 lbs. pressure. These tools are now necessary adjuncts to a large colliery, and are becoming more largerly used. The same engine drives a saw-mill at the back of the shops. In the boiler-shed a punching and shearing machine is erected and worked by a separate engine with 6-in. cylinder, 20-in. stroke, supplied from the same boiler. The new boilers have all been constructed here, and others are in progress.

The gasworks has nine retorts, and supplies the offices, agents' houses, and the pit banks, and is carried down the pit by steam jet, on Huntriss and Swinburn's principle for lighting the underground main roads.

Seghill coal is shipped at Howden Dock, on the Tyne, as "Carr's Hartley;" it is supplied to the British, French, and other Governments, to the principal steamship companies, and foreign markets, as a first-class steam coal. M. B. G.

UNINFLAMMABLE WOOD.

SIR,—The recent accident to two training ships in the Thames, which in one case involved serious loss of life, and in both immense destruction of property, naturally brings to the front the question can such disasters be prevented? I am induced to address you, and ask what has become of the process patented by the Rev. Dr. Jones for rendering all kinds of wood uninflamable, and which I have heard has been tested in different places, including one of the royal dockyards, and in all with the most perfect success. The mineral oil which caused the first disaster can, I understand, be burnt with perfect immunity on wood treated by this patent process without danger of the wood taking fire; in fact, being, as I understand, perfectly fire-proof. If such be the case the public have a right to ask why this uninflamable wood is not made use of in vessels, and particularly training-ships, at least that part of the ship where those oils are stored.—*Cornwall, Jan. 14.* W. B. C.

MINING IN QUEENSLAND.

SIR,—The quantity of tin forwarded from the Warwick Terminus during the month of October was as follows:—

	Tons	c.	qr.	lbs.
Stream tin	571	8	2	21
Ingot tin	16	12	3	1
Total	588	1	2	22

Equal to 595 tons stream tin. The previous month was, when reduced, equal to 435 tons; the increase for October being, therefore, 160 tons, and the largest quantity forwarded in any one month from Warwick since the discovery. This increase is not caused by any extra production, but is the accumulation of the past ten months that is now being pushed forward on account of the rise, and I am credibly informed that had the carriers been equal to the occasion there would have been from 1200 to 1500 tons forwarded. This present month (November) will see a large quantity of tin forwarded if prices remain as they are.

A party of gentlemen, said to represent English capitalists, are at present visiting the several great mineral districts of this colony. I hear they have already secured several copper blocks, and have offered for the Neardie Antimony Mine. If they are what they represent themselves to be they can secure some of the finest and richest mines in the world at their own price. RESIDENT.

Brisbane, Nov. 9.

SOUTH AURORA MINING COMPANY.

SIR,—In the Journal of Saturday last I find two articles which should prove of interest to all who, like myself, were induced some years ago to become subscribers for shares in the South Aurora Mining Company. The first article which I notice is an extract referring to the Eberhardt and Aurora Mine, the neighbouring property to ours; the second is a letter headed "Corsican Mines," referring to some properties held and worked by the South Aurora Company. The extract from the "White Pine News" runs as follows:—

> The Eberhardt and Aurora Company are sinking a working shaft, which is now down to a depth of 600 ft., and the indications are very flattering for striking a body of ore almost any day. When this occurs then the problem of the "ore not going down" will be solved, and every company owning mines on the Hill will be ready and willing to go down. Several San Francisco companies are only waiting for the English company to do the prospecting, when they hope to reap the benefits of it, &c.

This, combined with the letter referred to, induced me to look up the last report received from the South Aurora directors, so as to see what they were doing for us. I find that the South Aurora Mines are lying dormant. I suppose the present directors, who, I am happy to say, are not those who held seats at the original board, intend to follow the shrewd example set them by other mineowners in San Francisco, and wait to see how far the Eberhardt and Aurora succeeds with their experimental shaft before throwing more good money after bad. This is, doubtless, a wise course. In the meantime, however, for shares which originally cost me 5*l.* I cannot get 10s., and I think it is in a great measure owing to the peculiar showing of the balance-sheet, which makes a simple statement of expenditure against assets represented by cash in hand, the mines in America, and sundries. The bonus shares received from the several companies which the South Aurora has promoted or assisted are only mentioned at the end of a report under the heading of "Bonuses obtained during the past year"—viz.:

From the Gilbert and Chaudière Company shares	£ 7,500
Olmeta Copper Company of Corsica shares	40,000
Lama Company of Corsica shares	40,000
Anquilla Phosphate Company bonus of shares	10,000=297,500

Although I fully endorse the correctness of not putting a fictitious value on these shares until their value is established beyond doubt, still I would submit that it would be only justice to the present South Aurora shareholders, whose shares are by such accumulation constantly declining in their market value, that these fully paid-up shares in the above companies should be divided among them, and receive thereby some equivalent for the money spent, even though their value be prospective.

The letter in last week's Journal headed "Corsican Mines," as well as the announcement that a shipment of ore is on the way, entitles me to the supposition that the shares in the Corsican mines may be,

or become, of value, in which case I should certainly prefer to hold my portion in my own name.

AN ORIGINAL SOUTH AURORA SHAREHOLDER.

Manchester, Jan. 11.

ON THE MINERAL RESOURCES OF CORSICA.

SIR,—During the last few months the Island of Corsica has become an object of interest to some English speculators, and it is to us a matter for surprise that so conveniently situated and highly mineralised a country should so long have remained undeveloped. Separated from Sardinia by the narrow Straits of Bonifacio, the two islands in all probability originally formed one land, and being in close proximity to the Island of Elba and the coast of Tuscany, it might be anticipated that, surrounded as it is by lands so rich in mineral contents, Corsica could hardly remain a barren field for the metallurgist. From the earliest times, however, this island has been *known* to be rich in mineral wealth. Many centuries before the benefits of civilisation were introduced into Corsica the inhabitants possessed articles of iron and copper, such as weapons to use against their would-be conquerors, and implements, utensils, and tools for peaceful and domestic purposes. This simple fact alone ought to suffice as a proof that at a remote period of the existence of the island copper and iron were found here in quantities and qualities, such as would permit of easy reduction by the primitive means known to what might truthfully be termed barbarians or savages. Diodorus of Sicily, Strabo and Plinius the elder, mention Corsica as rich in those natural treasures which the Romans were ever anxious to conquer and possess. In the oldest monuments of Rome, Florence, and elsewhere, specimens of marbles and porphyries of Corsican extraction are still found, thus proving how far back in the age of Europe the mineral resources of Corsica were known and appreciated.

The experienced tourist cannot pass through Corsica without being struck by the highly mineralised appearance of the country generally, and one cannot help being of opinion that such superficial indications as are everywhere perceivable, cannot but announce the presence of large metalliferous formations. That iron and copper were extracted from the bosom of the earth in Corsica at a remote period is evidenced not only by the fact above related of the inhabitants having used articles made of those metals in the earliest ages, but also by quotations one might make from ancient writers. Diodorus and Senecca, who were exiled to the island, speak of the talent of the Corsican barbarians in making swords and knives and ploughs and nails from the products of the ironstone which they find amongst the rocks of their mountains. Plinius the elder speaks of the beautiful copper utensils for cooking, which the Roman General Scylla brought over from Corsica as spoils of war. The same writer speaks of copper nearly ready to be forged and made into any shape by hammering being found in the neighbourhood of the city of Aleria, the capital of the Roman colony. Again, various mountains or heads of rocks have been known from the earliest times by names announcing the presence in those mountains or rocks of various metals—for example, near the above-mentioned City of Aleria, on the terrritory of the Commune of Linguizzetta, there is a huge cape of rocks called from time immemorial *Pentone al Ramo*, which means point or mountain of copper. In another part of the island there is a locality known for centuries by the name of Argentilla, and in that part are found, and long ago were known, to exist numerous indications of silver-bearing lead. Boswell, who visited Corsica shortly after General Paoli's visit to England to negociate for his native land the benefit of England's patronage and colonisation, speaks very highly of the mineral riches of Corsica, which had "struck his eye and touched his hand." In the present century we have the result of the studies and observations of several authors, amongst them a German writing under the *nom de plume* of "Gregorovius." A book in 2 vols. 8vo., with maps and plans, was published by the latter visitor to Corsica in 1835, wherein one can find a geological and mineralogical description of Corsica, which the author found fully deserving the development advocated in his publication. After these facts, and without calling to our assistance many others which we could enumerate, we think it proved that Corsica is really a mineral country equally with its neighbours Sardinia, Elba, Tuscany, and Piedmont.

How is it some will say, and apparently with deep common sense, how is it if Corsica be rich in mineral that these are not worked by the inhabitants, or by foreigners called to the place by the tempting probability of finding their fortunes in Corsican mines? We answer, how is it that the Island of Elba, which was worked long before the Christian era has not been exhausted, and why is it now only worked sufficiently to produce a few cargoes for small schooners once or twice in six months? And how was it that only a few years ago whole districts in England covered with mineral indications were left unworked by the miner? If plausible answers can be found to these questions, cannot equally plausible ones be given to explain why the mineral resources of Corsica, though known or suspected long ago, have not hitherto been worked or looked for? We may venture to offer some of the reasons. Precisely at the period when the leading industrial nations of Europe, and at their head the English people, saw in the rapid progress of science means placed at the disposal of miners for the recovery of metals upon conditions of economy and facility sufficient to encourage a wider extension of mining industry and enterprise, the Island of Corsica happened to be almost excluded from the rest of the world, even from the nearest lands of Italy. Living as they had done, and did, in constant warfare with the Pisans and Genoese, their would-be rulers or conquerors, the Corsicans, not only during that period but even long after being freed from strange oppression, remained *de facto* inaccessible to the idea of developing the resources of their country by their own industry. Their agriculturists wished only to produce enough to feed and clothe them in their patriarchal villages, perched on the tops of mountains or rocks, the natural fortresses or observatories against the invaders of old. The traditions transmitted from their ancestors the bad treatment received in times past at the hands of the Romans, the Pisans, and Genoese always made them, and as a rule still makes them, little anxious to invite the assistance of foreign capital, and still less of foreign labour, in order to develope the natural riches of their land. Thus it is that while in agriculture Corsica, with its exceptionally favourable climate, might produce 100 times more than it actually does, the mineral riches deposited in its soil by Nature have been and still are, generally speaking, left untouched.

During the last 20 or 25 years there have been, however, some exceptions to this rule. Acting either under the inspiration, or in connection with people from the Continent, some Corsicans trained to understand the progress of ideas by their education in Paris or other French towns, have opened the way to the development of the mineral resources of their country. Several mineral deposits, long ago known to exist, have become mining concessions in the hands of private parties or societies, and some work has been done, not enough to render justice to those mines, but certainly enough to encourage others in following the example given them, and to invite the much needed help of speculating capitalists. Want of capital in many instances, and *want of mining knowledge* in nearly all, have paralysed the progress of development, but the time is probably not far distant when, thanks to to the increased facilities of communication, which until quite lately were absolutely *nil* in most parts of the island, and thanks to the intervention of foreign assistance in the way of money and experience, many of the hitherto conceded, and many more of the not yet conceded, mines of Corsica will be worked to such advantage as their natural conditions allow one to expect.

Rather more than 12 months ago two companies were registered in England under the names of the Olmeta Copper Company of Corsica (Limited) and the Lama Company of Corsica (Limited). Both of these companies were formed by a process of disassociation from the South Aurora Consolidated Silver Mining Company (Limited), with the same board of directors. We understand that the former mine, to which a greater energy has been directed, is progressing very favourably, and that a large deposit of copper ore has been discovered, the greater part of which has been left standing as reserves. A trial shipment of about 120 to 150 tons is now on its way to England, and we hear that a similar quantity will be dispatched about a month after. The reserves alluded to, we are told, amount to 500 and 600 tons, and are only a few feet from the surface, the mine being worked by levels running from the side of the high road into the mountain.

The other mines of Corsica held by native or French owners, whether now working or closed, will be considered and commented upon in a future paper; and, in conclusion, we heartily wish success to those English speculators, who in the adventures mentioned will surely become the pioneers to a new field of mining adventure in Europe.—*Bastia, Jan.* 8. CORRESPONDENT.

MINING IN CORSICA.

SIR,—I observe in the Journal that the first shipment of copper ore has been made from the Olmeta Mine, and as I am very well acquainted with this mine I am surprised that a very much larger quantity has not been sold, but I suppose this is owing to the dressing-floors not being complete. This mine is of vast extent, being about 10 square miles, with one of the finest copper lodes running through it as ever was seen, cropping up to the surface, producing copper ore; the lode is about 60 ft. wide, and can be traced for several miles, with as fine a gossan as can be found, and impregnated with sulphate of copper and green carbonate, the latter in great abundance. Having had nearly 40 years' experience in copper mines warrants me in saying that there is no doubt by energetic development immense quantities of copper ore will be returned, and with comparatively small cost, having the command of very cheap labour. Having visited Corsica several times, I have had the opportunity of examining nearly the whole of the island, and can speak pretty positively as to the geological position. I am surprised to find so many important properties undeveloped. I have found in many places minerals cropping up to the surface of the ground in paying quantities, and which bid fair for large and permanent profits.

The Lama property, which belongs to the same company as the Olmeta, is about 20 square miles in extent, with about 20 known silver-lead, copper ore, manganese, and other lodes of importance. The last time I visited this I saw one of the silver-lead lodes, which was then worth full 15*l.* per fathom only 3 fms. from surface. I must confess that this is a most important property, and will, no doubt, require a large amount of capital to fully develope. But I would recommend the development of the most productive points, so that the unproductive and promising points could be proved with a portion of the profits of the former. I am pleased to say that the French Government offers very great encouragement for the development of the mineral resources of Corsica, and what surprises me most is why more English money has not been applied to this important island, being so near at home. A SHAREHOLDER.

Llanidloes, Jan. 12.

THE DIAMOND—No. VI.

SIR,—In consequence to me, on the one hand, of a very gratifying compliment, and secondly, from the circumstance of the recent discovery of a diamond of unusual dimensions, I feel impelled to revert to the question of *locale*. By the politeness of Mr. Parke Pittar, I have lately been afforded the pleasure of seeing and closely examining a gorgeous and almost unique gem, "The Star of Africa," and in this respect have for once been momentarily placed upon an equal footing with the Shah of Persia, this diamond having been exhibited to that potentate, from whom it elicited expressions of as great pleasure and astonishment as an Eastern monarch is ever known to give utterance to. At the time of the Shah's inspection the stone was in its rough state, and weighed 288¾ carats. It now constitutes a brilliant in all its gorgeousness, realising 128½ carats, exceeding the world-famed "Koh-i-noor" by 26, and even the heavier, though it is said less perfect, "Star of the South" by 4 carats. The "Star of Africa" has been mounted as a star, and is exquisitely set in a frame, and surrounded by 105 brilliants and 79 rose diamonds, the former weighing upwards of 59 and the latter about 1½ carats. The *tout ensemble* is brilliant beyond the power of the pen to describe. It must be seen to be fully appreciated. Even the exquisitely tinted drawing of it with which I was, at the time of my inspection, presented yields but a very faint idea of the regal splendour of the original. I can compare it to nothing but the magnificence of a large prill of silver when giving off iridescence in the muffle at the moment of parting with the last scintillation of lead in cupellation, and this is, indeed, a sight worth witnessing, especially by enthusiasts in chemistry, or those to whom chemical experiments afford attractions beyond the ordinary frivolities of art, and to whom few opportunities of the character are presented by even the most demonstrative experiments of the lecture table, or the expositions of the popular exponents of chemistry. The second inducement for retrogression is to record the fact which reaches England by the last mail—the discovery of two diamonds at the Cape, one described as a monster, weighing 300 carats, and another of 103 carats, the latter realising the sum of 3850*l.*, in, of course, its rough state.

It may be taken for granted that the true composition of all precious stones is well known, and has been accurately defined in various chemical works treating upon the subject; thus spinel is composed of alumina and magnesia, whilst sapphire and corundum are simply alumina in a crystallised state, and can be produced artificially. Many of the beautiful phenomena known as precious stones have been so accurately imitated as to deceive all but experts, and even in some instances many of these have, at times, hesitated prior to pronouncing upon the merits of specimens submitted to their examination. Size, weight, and form have presented no insuperable difficulty in the matter of imitation. After regarding chemical constitution, the question of crystallisation has occupied the attention of the operator, and here has occurred the main difficulty in producing the gems according to the formulæ given by analysis. In the instances of sapphire and ruby, or corundum, the obstacle has been overcome, but, though the precise proportions of each element which builds up the frame of spinel, emerald, topaz, garnet, tourmaline, *cum multis aliis*, are well known, art has not yet arrived at the point of effecting the degree of crystallisation requisite to produce perfect copies. It is hence evident that there exists a force or influence which regulates the figure of inanimate matter analogous to that which gives form and vitality to organism. From these observations it will be gathered that other agents than the natural ones, are enlisted into the service of the artificial gem manufacturers—such, in fact, is the case. Clever and even marvellous as are these imitations in colour and transparency, they lack the "optical effects of brilliancy and fire," and therefore, in the strict sense of the term, they are not artificial gems, but substitutes thereof.

Limiting my remarks now to the legitimate text, the diamond, its composition may be summed up in one word—carbon—the principal constituent of both coal and graphite, but, whilst associated with other elements in the last-named substances, carbon in a pure and highly crystalline condition is recognised as the diamond. Such is the simple definition of this most highly prized gem—a fact which has been fully verified by repeated experiments by its combustion in oxygen, when the product was identified with carbonic acid. These experiments were comparatively simple. Not so, however, the numerous attempts to form the gem. There appears to be little doubt that this object has been effected, but the resulting specimens have been characterised by their almost infinitesimal minuteness. Hitherto all the appliances of science and art have failed to produce a diamond of any appreciable size, though there exist fabulous records of the object being effected. Perhaps I cannot do better than furnish the following illustration, which savours strongly of the results attributed to the age when the alchemist pursued his mystic researches after the universal solvent, the universal medicine, and the philosopher's stone—the first to dissolve all created matter, the second to cure all maladies to which human flesh is heir, and to prolong life to an illimitable period, and the last to convert the baser metals into gold. There lived some 70 years ago, in the third story of a small house in Paris, an adept who professed to manufacture sizeable diamonds from amorphous carbon. When on his death-bed he was earnestly solicited by his friends to communicate his wonderful secret he replied—"It is quite true I do know how to make the diamond. I have made diamonds as large as tomatoes, but I have thrown them all into the Seine. The secret is my own. It would make the world no happier or better, and it shall die with me till someone else re-discovers it. As for the diamonds I have made, they would only have brought misery upon their owners. They are better lost. You are better without them." Uttering these words, he departed to those realms where meretricious ornaments are unknown and uncared for, and now his survivors have to content themselves with the knowledge that this most precious of all existing gems can be imitated by art, though not upon the grand scale that Nature presents it in her laboratory—the ever active and frequently impenetrable womb of the earth.

Leaving fable we come to the serious enquiry of reality—can diamonds, apart from microscopical ones, be formed? Of the existence of these there remains but little doubt. By the aid of a powerful galvanic battery acting upon carbon it can be fused, and, as in the form of graphite, more highly crystallised, still remains the difficulty of agglomerating the atoms or fragments. A recent communication from the French Academy of Science reports that M. Lionnet adopted this plan, being a modification of that of M. Despretz in 1853, in which the latter subjected carbon, in conjunction with sulphide of that element, to galvanic action, whereas M. Lionnet "took a long and thin, gold or platinum leaf, rolling upon it a thin piece of tinfoil, and putting it into a bath of sulphide of carbon. The liquid is decomposed under the influence of the weak electric current thus excited; the sulphur combines with the tin, and the carbon is deposited in crystals at the bottom of the vessel." The author adds that the diamond must be produced by nature in a similar way, but he omits to add that diamonds of any extraordinary magnitude have resulted from his process, though he states that artificial diamonds have thus been obtained. It has been somewhat sagaciously hinted that if complete success had supplemented the experiment the discoverer "would not have been in a hurry to report his progress." There remains, therefore, nothing for us by way of a verdict but to return that which our northern juries do where doubt exists upon the merits of the case before them, "not proven."

Perhaps I cannot do better than conclude this article by giving in round numbers an estimate of the value of diamonds, as collected from Jeffries' work on the subject, premising that his table is too extensive to give more than a fraction of what he has afforded—

	£		£
1 carat	8	8 carat	512
2 ditto	32	10 ditto	800
4 ditto	128	20 ditto	3,200
5 ditto	200	50 ditto	20,000
6 ditto	288	100 ditto	80,000

A carat is about 4 grains. No fixed rule can be laid down by which the value of diamonds can be calculated. The value of a perfect 1-carat stone (say, 4 grains), is from 8*l.* to 18*l.*, others in proportion to the above table. According to demand and supply will prices fluctuate. W. WHITE, M.P.S.

Laboratory and Assay Office, Finsbury-place, City, Jan. 5.

GOLD IN WALES—No. XV.

DOLGELLEY DISTRICT—TYN-Y-GROES SECTION.

SIR,—I propose to include in the Tyn-y-Groes section the mining setts known as the Sovereign Mine, Cae Mawr, Glasdir uccha, Glasdir isaf, Tyn-y-Penrhos, Penrhos, Friddgoch, the River Mawddach, Caegwernog, Berthlwydd, and Cefn Coch.

The Sovereign Mine (Llaneltyd parish), situate about 3 miles north of Dolgelley, adjoining the Prince of Wales Mine on the west and Cae Mawr sett on the north-east, contains an area of about 200 acres.

MR. C. R. DIXON, M.E. (1862) wrote:—"There are five auriferous lodes traversing this property, the main lode showing at surface in many places from 2 to 4 fms. in width, and is one of the lodes now being wrought upon in the adjoining mine—the Prince of Wales. The gold lode of the Imperial Mine also runs into it, and forms a junction in the Sovereign sett. The main lode by assay yields 16 dwts. (*sic*) per ton. I would counsel you to immediate action."

Capt. THOS. FAULL (1862) wrote:—"From the enormous size of the champion lode 200 tons of auriferous quartz can be raised daily for about 4s. 6d. a ton. Supposing you could only operate upon 100 tons a day, at 10 dwts. per ton, it would give 50 ozs. of gold daily, enough, I would say, to leave a handsome profit. You must not run away with an idea that if visible gold is not to be seen (*sic*) the quartz will not pay; thousands of tons are being stamped in California without even a particle of gold being perceptible to the eye—nay, not a trace could be seen through the most powerful glass. Does it pay? Yes; but not to work on a small scale—a sufficient quantity must be put through the stamps in order to produce a profit, or, in other words, merely by rule of proportion. If 50 tons of quartz will give so many ounces of gold per day what will 150 tons give? I have known the Clogau Mine since 1836, having worked the property in that year for copper only. Gold, as we may naturally suppose, was not at that period even dreamt of. I shall be very happy to take a few hundreds of shares in the concern."

MR. JOHN LONGMAID (1862)—	Assays. Lead per cent.	Gold to ton.			Silver to ton.		
Sample of quartz, No. 1	42·5	4 ozs.	15 dts.	16 grs.	12 ozs.	8 dts.	6 grs.
,, No. 2	—	2	5	17	0	9	19
,, No. 3	—	7	0	11	0	19	14
JOHNSON, MATTHEY, and Co. (1862)—							
Sample of quartz	4·3	1	12	0	3	5	12

MR. FRANCIS LISABE certified (1862)—The specimens of gold-bearing quartz from the Sovereign Gold Mines I have ascertained contain over 3 ozs. of gold to the ton of ore, of 20 cwts.

Caemawr Mine (Llaneltyd parish) is about five miles from Dolgelley, on the road side leading from Dolgelley to Tanybwlch.

Capt. GEO. WILLIAMS (1864) wrote:—"There are six lodes traversing this sett. No 1 has had a little work done on it; it is a fine lode, about 4 ft. in width. This I should call the champion lode, and it can be easily worked to a great depth by levels from the River Mawddach. No. 2 has been worked for copper for many years on a small scale; many tons of ore were sold from this lode, and being rich, it was sold in my time at 18*l.* a ton, and it was from this lode that I first heard of the existence of gold in Wales. It was reported that the copper, after being dressed, produced 4 ozs. of gold to a ton. No. 2 lode is opened on a junction with No. 3, about 400 yards west, showing kindly-looking quartz. No work has been done on No. 4. On No. 5, several tons of copper ore have been raised at the junction of lodes 5 and 6, of similar richness to No. 2 lode. A level has been driven in No. 6 lode, close to the road side, to intersect the lode, but very little work has been done on the lode. This property can be very easily worked—the turnpike road runs through the sett—it is of abrupt elevation to the height of 100 fms. or more. The sett runs down to the River Mawddach on the east, affording water-power in plenty for machinery. Visible gold has been found on the property, and it is very probable that it will also be found in the alluvium, as at Dolfrwynog."

Tyn-y-Penrhos Mine (Llanfachreth parish), bounded by the River Mawddach and Cae Mawr on the west, and by the Penrhos (or Benrhos) sett on the north, contains an area of about 156 acres. There are several lodes in this sett similar in appearance to those in Penrhos sett. The alluvial certainly contains gold in considerable quantity, one pepita was found, weighing 19 grs. Probably a good deal of the gold was washed down from the mountains near Gwynfynydd and Cwmheisian.

JOHN POWELL, one of my miners, wrote (1862):—"The washing ground is productive all along the river side, and that very regular. In some parts we have gone down 3 ft. to 4 ft., and find it quite as rich in the lowest part."

Another authority of 1862 wrote:—"On one lode a level has been driven on the north side of the little river running into the Mawddach. It shows favourable quartz, and runs into a strong back. Two trials have been made on the bearing to endeavour to find the lode at different angles. This lode promises to increase when the level is continued."

Penrhos, or Benrhos Mine (Llanfachreth parish), is bounded by the River Mawddach on the west, a little anonymous river on the south, and Tyn-y-Penrhos on the south-west. It contains an area of about 178 acres.

Capt. G. WILLIAMS (1862) writes:—"Lodes are to be seen cropping out at surface in several places, although very little work has been done upon them. No. 2 lode shows promising quartz, containing galena, copper pyrites, and blende, which have the character of being auriferous. This property can be worked by water-power in two places. Trial pits were made by Mr. Readwin to try the alluvial for gold, and specks were found the whole distance by the side of the Mawddach river. Some pieces of the gold weighed as much as 7 grs."

Fridd-goch (Llanfachreth parish) is situated to the north of the Glasdir Mine, and eastward of Penrhos Mine. There is auriferous quartz upon this farm. Visible gold in quartz was found by Mr. Vaughan's gamekeeper, or one of his sons, in 1864. Therefore, in July, 1875, whilst at Tyn-y-Groes, recollecting that I paid in 1864 50*l.* for a fourth of a tack-note of this property, and finding that this sum went to pay Mr. Vaughan for the tack-note, I requested permission of him to walk over the property. No notice was taken of my written application, but, thinking that I had paid quite enough for a day's prospecting, I took French leave, went over the ground notwithstanding, and found there gold visible in quartz. I am glad of the opportunity of recording this fact from personal observation, as I had previously doubted it, and said as much to the detriment, perhaps, of the gentleman to whom I gave the money.

Lower Glasdir (Issaf) Copper Mine (Llanfachreth parish) is situate about half a mile east of the fourth milestone on the turnpike road leading from Dolgelley to Tanybwlch in the Mawddach valley. This property is very remarkable, and abounds in iron and copper pyrites, which are frequently arsenical. Copper ore has been dressed up to 14¾ per cent., and the ores generally are auriferous and argentiferous.

Capt. JAMES NANCARROW (1864) wrote:—"The sett comprises about 120 acres, and in the middle there is a mound in which there is a deposit of copper and iron pyrites. This deposit of ore is about 120 fathoms long, and 40 fathoms wide, and for the whole length and width copper ore is thickly impregnated throughout; the

formation is clay-slate, with bands of elvan running through it. The mine is at present opened by an adit level driven in from the south side of the hill, and the lode or deposit is opened out to a depth of from 12 to 16 fathoms, and in length from 60 to 70 fathoms, and from 10 to 30 ft. wide. The whole of these workings are strongly mineralised, and showing on every point where exposed to be strongly charged with copper ore, &c. In the bottom of the adit level a shaft has been sunk 10 fathoms, where the lode maintains its size, and where the iron pyrites is giving place to copper ore. There have also been two sinks in the bottom of the level, and in each of these sinks the lode has had a very favourable appearance – in fact, the deeper the mine has been sunk the richer and more concentrated has been the copper ore. The sett is bounded on the north and east by a river, to which the ground slopes from the mine to a vertical depth of 70 fathoms, affording great facilities for draining as well as for dressing purposes. This river can also be applied for driving machinery, for pumping, and for the dressing of the ore, which is of great value to the property. This deposit of ore is such as is seldom found in regular mining. Such was the case, however, on the Parys Mountain, in the island of Angleseа, and I have very little doubt, if this mine is fairly and economically worked, but that there will be large profits derived. To do this new machinery must be put up in the shape of stamps, and then with a good force I see not the slightest difficulty of the concern becoming one of the best in the United Kingdom, for the mountain will produce any amount of ore, and with proper appliances from 200 to 300 tons of ore may be returned per month. I may say, in conclusion, that this is not a speculation but merely an investment, and with the laying out of a few thousands of pounds you may have a regular flow of dividends, and such as are not few and far between. This property will bear ventilation."

Mr. JOSIAH RENFREY (1864) wrote:—"From the eastern part an adit, extending over 80 fathoms long, and in several places nearly 40 ft. in width, has been driven, from which a considerable quantity of ore has been taken. For the whole length of the 120 fathoms, on the northern side of the adit, the ground is strongly intermixed with iron pyrites, showing a fair produce of copper ore—indeed, in several places very rich branches of copper ore are to be seen. About 30 fathoms from the entrance of the adit a shaft has been sunk 7 fathoms, from which rich work was extracted, and it is worthy of note that the large body of iron pyrites at surface has invariably given way to copper ore the deeper this deposit has been opened out. In the western end of the deposit there is a good course of ore, with every appearance of similar ground going west, as seen in the opening across the end. This may extend a considerable distance, and add much to the value of the mine. A cross-cut has been driven north, laying open a portion of rich rock, but the end of the cross cut stands at present in a poor piece of ground. There is no doubt but this large ore-bearing channel is divided into two parts by a narrow band of killas, in which this cross-cut now stands, and, judging from the outcrop of the second or northern portion, it will be found to be by far the richest part, as in one place, and only 10 ft. from surface, paying ground may be seen. The nature of the ground on the north eastern side of this deposit is very favourable for deeper workings. An adit from this direction driven 80 to 85 fathoms would bring in a depth of 16 to 17 fathoms under the present ore, and by a still larger cross-cut the place can be reached to a depth of 70 fathoms. No power of any kind will be wanted for draining purposes. It would be advisable to commence almost immediately an adit to open out the ground under the deepest point of the present explorations, which would take about 18 months to accomplish: there is, however, an immense body of good paying ore ground above the present adit which can at once be taken away, and will last for years to come. I have no hesitation in saying that this property presents unmistakeable features of success, and with a proper mode of treating this mass of ore I am confident that large profits will be realised."

Capt. T. MARTIN (1864) wrote:—"Near the centre of the sett is a mound or upheaval of an oval form, composed of an indurated clay slate, highly mineralised, with copper and iron pyrites, and traversed obliquely with a few small bands of elvan. The mine is at present opened by an adit, driven on the south side of the deposit for upwards of 70 fathoms from east to west, and about 18 fathoms in depth. A shaft has also been sunk 10 fathoms below the adit. In several places the ground has been stoped away to upwards of 30 ft. in width, the whole deposit thus exposed being highly mineralised, the average yielding a fair produce of copper. I was credibly informed that in the bottom of the shaft the yield was 3 ton of ore per fathom, of from 7 to 8 per cent. produce. About 60 fathoms west of this shaft the ground has been stoped away under adit in two places to a depth of 7 fathoms: here also the ores are much more concentrated, yielding from 3 to 4 tons per fathom, and I believe that as this deposit is explored in depth it will continue to improve, as throughout the whole distance, from surface to the deepest part yet reached, a continued and well-defined improvement takes place, the iron pyrites gradually dying out and giving place to copper pyrites. The average of a large number of fair samples of the ground at present opened taken by myself yielded 12 per cent. of marketable ore of 7¾ produce: this at the present standard is worth 6l. nearly per ton, and this after deducting returning charges, &c. There is, however, one stope open where the ground is much richer than this, producing 22 per cent. of ore of 14¾ per cent. produce, the surrounding features giving every indication of a large and continuous supply: the ground here I estimate to be worth over 40l. per fathom. The whole of the northern side of the deposit is untouched, with the exception of a few small drivings, &c., of a few fathoms in extent to examine its quality: in these places the ground is of precisely the same character as in the southern side, where the adit has been driven. The stope of the ground from the large deposit of ore is particularly favourable, inasmuch as the mine can be worked to a depth of about 70 fathoms by adit levels. The immense quantity of profitable ore ground laid open, as also the very favourable indications of still better ore below adit, renders the prosecution of this enterprise devoid of the risk attending mining in general. I estimate that with an outlay of from 4000l. to 5000l. over and above the returns obtainable from the present machinery 100 tons could be raised and dressed daily. I by no means set this as the limit of successful operations here, as upon the mine being opened in depth the works might be extended almost without limit, the quantity of ore ground being so great as to last for generations."

This property holds a prominent position as a Merioneth copper mine, inasmuch as more than 2000 tons of dressed ore have been sold therefrom at various times. I have an impression that the whole of the ore was more or less auriferous, and probably some of it, like "the poor copper ore" of Clogau, before alluded to, very richly so. That this is very likely to have been the case is supported (I hear) by the fact of smelters making, unasked (!) occasional allowances for the contained gold. I have myself found visible gold associated with copper pyrites at this mine, and have seen in the possession of Mr. Roberts, of Avoca, some specimens of great beauty and richness.

In 1866 Mr. David Spence and I made sundry experiments at Gynfynydd with ores from this mine, to test the efficacy of sodium in processes of amalgamation. The results will be given more conveniently hereafter. It is enough to mention in this place that all the metallic minerals, taken indiscriminately, contained more or less gold. I may as well say that my investigations were a good deal stimulated by what appeared to me authentic information that something like 250 ozs. of gold and a couple of tons of silver were sold weekly or fortnightly in Great Winchester-street by one eminent firm of smelters, the result chiefly from poor copper and zinc ores. Never having held shares in this mine I am not in possession of official particulars. I have, however, been able to pick up the following, which will furnish an interesting supplement to the foregoing statements of fact and opinion.

The present proprietors appear to have sold between 7000l. and 8000l. worth of ore. Numerous assays of the ore have been made during the last two or three years, and one-third of the ore sold is thought to have contained an average of an ounce of gold to the ton.

The following account sales of two parcels of the second-class ore, together with assays (furnished by the brokers with the account), illustrate the injury to the company by selling the ores in bulk instead of concentrating them —

Account sales.

43 tons 17 cwts. 3 qrs., at £2 12 6				£128	4	4	
43 2 0 at 2 4 6				107	0	3 =	£235 4 7
Freight and broker's charges							32 15 0
Total							£202 9 7

Tons.		Copper.	Silver.	Gold.	Sulphur.
49 ...	No. 1	3½ per cent.	5 ozs.	1 oz.	36 per cent.
49 ...	No. 2	3 „	6 „	1½ „	41 „

The contents of the ore in the above account sales have an abstract value of 900l., which would be subject only to the carriage freight and returning charges for smelting, and allowing for them an outside estimate, the copper, silver, and gold, had they been concentrated probably would have produced three times the amount actually realised.

Although the foregoing applies chiefly to ores of the second-class, in which the gold appears to be always more abundant, the process of concentration is necessary also for the first-class ores, ranging from 6 to 9 per cent. copper.

The machinery includes three water-wheels and a turbine, one of the largest of Blake's stone-breakers, two crushers complete, numerous self-acting jigging-machines, &c.; also smiths' and carpenters' shops, offices, and everything necessary for a first-class establishment, and it certainly is amongst the oddities of mining adventure in the district that this valuable property is at a standstill.

Upper Glasdir (Uchaf) Mine (Llanfachreth parish) adjoins on the north the Glasdir-isaf Copper Mine.

Capt. K. ROBERTS (1856) wrote: "The sett comprises several lodes, the principal being 5 ft. wide, one-third of which is well filled with mineral, containing by assay from 8½ to 12 per cent. of fine copper, and has been proved by a short level and a shaft not more than 12 ft. deep, yet the richness of the lode has very considerably improved, even at so shallow a depth, and gives every prospect of a rich deposit of copper ore."

Capt. K. ROBERTS (Jan. 31, 1857) wrote: "During the past week we have had no alteration in the shaft, the footwall of the vein is not quite so smooth, but composed of nice killas. The eastern or hanging wall is firm and solid. The branch of copper I before mentioned is sideways, the middle or inner one is continued the same width, and producing large stones of copper ore mixed throughout the mundic. The stratum is a beautiful grey killas, highly congenial in this district for mineral. I was the day before at the Lower Glasdir; judging from the stuff raised from the shaft I could not find the slightest difference between both Glasdir stratifications."

The River Mawddach.—Mr. Readwin (1862), working under licence from the Crown, obtained virgin gold nearly all along the eastern half of the River Mawddach from Cwmhesian to opposite Tyn-y-Groes Hotel, about 2½ miles in all. That the banks of this river contain a large quantity of gold I have not the shadow of a doubt. This is not mere theory, for I made a good many excavations on my own account, which remain to be seen, and, with a few exceptions (which I did not personally superintend), I found gold in all. In some instances at the water's edge I found scales of gold at the roots of the vegetation. I got about 2 ozs. of gold for about 25l. outlay. What my men got more than this they never informed me. A portion of the gold found by me in and upon the banks of the Mawddach is in the British Museum. The celebrated Cornelius Owen can show at all times in the tobacco boxes which he carries rare specimens of years of untiring energy as a gold washer in the Mawddach. What his total gains have been is known to himself probably. I offered him 5l. for a pepita once, and he declined to sell it. The chief value of these facts is that they point to their origin higher up the river somewhere.

Caegwernog Mine adjoins the Cefn Coch Mine on the north.

Mr. ETHELSTANE H. BLAKE, M.E. (1863) wrote: "This property is situated in a basin on the summit of the mountain range extending from the Mawddach river to the celebrated Clogau Mine, and consists of bands of ferruginous hornblende, slate, and greenstone running north-east and south-west, intersected by numerous veins of quartz, in some places forming strong quartz lodes with well-defined walls, and yielding lead and blende, sulphurets of iron and copper, giving in this sett, wherever examined, a percentage of gold. I consider the features of this property very peculiar, and differing entirely from any in this district hitherto worked. The Champion lode is the same lode worked at present in the Cefn Coch Mine—a lode of quartz 12 ft. wide, impregnated with iron pyrites containing gold."

Copy of certificate of assays by Messrs. JOHNSON and MATTHEY (1863):—"The nine bags of quartz (each weighing about 1½ cwt.) broken under the superintendence of our Mr. George Matthey from the various lodes marked and numbered as under have been carefully crushed and assayed for Mr. H. J. Standly, and are found to contain respectively the following proportions of gold and silver per ton of 20 cwts. of mineral:—

	Gold.	Silver.
C C, No. 1	0 ozs. 0 dwts. 16 grs.	Traces only
C C (A), No. 2	0 1 4	0 ozs. 15 dwts. 0 grs.
C C (B), No. 3 under	0 0 6	0 17 0
C C (C), No. 4	0 0 17	0 6 1 0
C C, No. 5	0 0 18	4 12 0
C C (D), No. 6	0 1 15	3 5 0
C C (E), No. 7	0 1 1	1 4 0
C C (F), No. 8	0 0 12	1 2 0
P, C C (G), No. 9	0 0 13	1 0 0
Specimen in No. 6 bag	0 4 8	3 0 0

To ascertain whether the gold existed principally in the sulphurets portions of each sample were concentrated by careful washing. The results given below show the approximate percentage of sulphurets, their contents of gold, and the loss of gold attendant upon the operation of washing—*i.e.*, the proportion which exists in the matrix of the ore:—

	Sulphurets, about	Gold per ton.	Loss, approx.*
No. 1	7½ per cent.	0 ozs. 8 dts. 12 grs.	under 1 per cent.
2	6½ „	0 12 8	31 „
3	1½ „	traces only	nearly all
4	33 „	0 1 20	14 per cent.
5	41 „	0 1 17	6 „
6	52 „	0 2 12	19 „
7	3 „	traces only	nearly all
8	1 „	„	„
9	5½ „	„	„
Specimen from No. 6 bag.	45 „	0 8 16	9 per cent.

Some small specimens from the same property gave the following results:—

	Gold.	Silver.
Pyrites and ferruginous quartz	0 ozs. 0 dts. 18 grs.	traces
Cupreous pyrites, galena, & quartz	0 3 6	0 ozs. 13 dts. 5 grs.
Discoloured quartz and pyrites	0 1 0	traces
Blende under	0 0 6	traces

The above samples were broken in the presence of our Mr. George Matthey, and committed to his charge under seal, and were not opened until their arrival at our works at London. Those marked C C 1 to C C 8, inclusive, were all taken from the bulk of the veins at the surface, and not selected, and are each from distinct veins on the Crown sett. The sample No. 9 was taken from an opening about 8 ft. deep upon the lower sett, and the smaller ones were selected for trial on account of their exceptional appearance.

* Percentage of gold remaining in the matrix, and, therefore, lost in the process of washing.

Mr. ARTHUR DEAN, C.E. (1863), wrote:—"These mines are placed on the same lodes, but under two different grants from the Crown: in the following report, therefore, they will be treated as one and the same concern. The main lode runs in a direction N.N.E. and S.S.W. for a length of upwards of 800 fms. and 600 fms. of which are in the Berthllwyd grant, and 200 in the Caegwernog grant, extending from the Afon Mawddach river on the N.E. to the Cwnigwnin brook on the S.E. Between these two rivers the lode traverses a lofty and precipitous ridge of hills, the crest of which on the course of the lode, is about 200 fms. above the Afon Mawddach, thus affording an immense field for mining operations without the aid of engine-power, as the whole of the hill may be drained by a deep adit level to be driven in from the level of the river: and, should the mine be sunk below this level, the Afon Mawddach will supply water-power sufficient to drain them any depth as well as to work crushing and stamping mills, &c., for dressing the ore. The lodes traverse a country composed of highly inclined beds of boralt, or elvan or clay-slate, which occur alternately at frequent intervals, thus producing a constant change of ground, which is found to be highly beneficial to the productiveness of the lodes: for it may generally be observed here, as elsewhere, that at the intersection of these strata the richest bunches are to be found. There are, also, two powerful cross-courses, which sever the lode, and several large branches of spar carrying silver-lead, which fall into and materially benefit it; in fact the same description of phenomena which render the Cwmhesian Mine so rich prevail here also to a great extent; the consequence is, that wherever the lode is seen in upwards of a dozen trial-pits which have been sunk on its track, ore has been found in all of them, and in three or four of the number of sufficient richness to pay the costs of breaking even from the surface. In one of the works of the Caegwernog sett upwards of 6 cwt. of rich ore was broken within 2 ft. of the surface, and in about 4 ft. in length; a small adit, which will discover this rich bunch at the depth of 3 fms. is now being driven into the side of the hill. In the Berthllwyd sett also a trial-pit has been sunk 3 fms., and has opened a portion of the lode, which, from the surface to the bottom, will pay the cost of breaking, &c., and leave a profit to the adventurers. Although all that has been done on these lodes has been simply by way of trial of its quality, yet the indications of a great and rich mine to be obtained by opening the ground in depth are so strong that hardly a doubt can be entertained of its proving a most lucrative speculation if fairly tried. The natural advantages it offers can hardly be exceeded; but these can only be developed by a series of systematic operations, which will afford every drainage without machinery, and a good road into the head of the mine for the transport of the ore and materials. If these points be attended to, then the cost of sinking shafts, of hauling the stuff to the surface, and sending it down to the dressing-floors, at a heavy expense, will be avoided, and the mine will be opened to the depth of 200 fms. The lead ore contains silver varying from 30 to 70 ozs. per ton of metal, but the average produce may be taken at 40 ozs. These samples have been taken from the surface; experience has shown that silver lead ores generally become richer as the mine increases in depth. Assay of ore: Lead, 80 per cent; silver, 44 ozs. per ton of ore. (Johnson and Lock.) Lead, 80 per cent.; silver, 45 ozs. per ton of ore. (Johnson and Sons.)"—N.B. "Since the above was written, Mr. Readwin writes that he has washed gold in fine dust from the alluvium at the top of the Great Champion lode, at Berthwllyd."

This is one of the Crown setts upon which specimens of Hafod-y-Morfa and Cwmhesian blende were made to do duty occasionally in times gone by. This was work of supererogation, for gold visible in blende could be found *in situ* at the time, although not so rich as the specimens fraudulently exhibited. I found myself several small bits, which from the peculiar character of the blende and other circumstances connected therewith, could not have been imposition in any way. I recollect finding upon this sett the ruins of a rude furnace, the debris of which contained a good deal of silicate of soda, in which were very numerous globules of gold. This gold, however, had probably never been associated with blende at all. In fact, some of its surroundings pointed to the Clogau mountain for its origin.

I shall next write of Berthllwydd and Cefn Coch, known distinctively as the "Welsh Gold Mines."

T. A. READWIN.

London, Jan. 12.

THE PRICE OF SHARES IN MINES.

Sir,—I have asked myself what regulates the market value or price of shares? Is it an imaginary value that each holder puts upon his shares, or is it an influence behind, backed by capital regardless of merit. I have just read the account of East Pool Mine meeting, when a dividend of 4s. 6d. per share was declared on the two months working, or at the rate of 1l. 7s. per annum. East Pool has the reputation of being one of the best, if not the best, mine in the county, its produce being various—tin, copper, wolfram, and large quantities of arsenic from the burning of tinstone. Capt. Maynard reported at the meeting the mine never looked better. The 180 was worth 19l. per fathom, and about 10 fathoms from Wheal Agar boundary. The 155 is about 3 fathoms from the barrier, and is worth 9l. per fathom. Other levels about equal value. Wheal Agar without doubt has the East Pool great lode, engine lode, and the south lode, according to the bearing and dip in the eastern part of the sett. What can be the cause of shares selling at 2½ to 3l. per share, when Wheal Agar is as deep, and has got the great lode in the shaft, and seen it for 14 ft. wide, and no wall? There are cross-cuts now driving to intersect other lodes. It appears to me these shares cannot long stand at present price. The analogy is to be compared to the Van Mine and East Van. As soon as the cross-cut in East Van intersected the lode the shares, which were very dull at 3l. per share three weeks ago, rise to 12l. per share; or the mine increases in value 150,000l., with every prospect of equalling the Van Mine in riches. There has been about 60,000l. expended in developing Wheal Agar Mine. The machinery is first-class. Steam stamps on the mine and little more outlay required. Investments can be made in a few selected mines, which will prove more secure than the best foreign loans or stocks, selling at very high prices.—*London, Jan.* 13. — —— A LOOKER-ON.

SEPARATION OF MINERALS.

Sir,—Allow me space in the Journal to inform "One Interested" that the minerals to which he refers can be separated and made saleable at a very moderate cost when compared with their increased value. By my magnetic process (which you fully described when the Silver Medal of the Royal Cornwall Polytechnic Society, with the *Mining Journal* Special Prize of the Miners' Association was awarded to me) blende and lead can be separated, however intimately intermixed, from iron pyrites, spathic iron, copper pyrites, and other minerals which materially lessen the value of the blende, and in most cases the value of the mineral extracted is more than the cost of the process, while the blende is much increased in value. I can refer "One Interested" to a mine where this increase of value was very great: a cargo, for which the highest offer was only 1l. per ton delivered at Swansea (equal to 8s. at the mine), was sold after treatment for 3l. 16s. per ton on the mine, the profit on one cargo covering the cost of the machinery erected for the process. Samples of ores I have received from abroad have the blende and lead more finely intermixed with pyrites than the Burrow and Butson ores, or any other Cornish ores I have yet tried, but all can be treated by my process.

Some of your correspondents speak of the difficulty of separating lead from blende by washing: this, where good classifying is adopted, is *comparatively* easy, as the following table of mean densities of various minerals shows:—

Galena	7·50
Blende	4·10
Iron pyrites	4·90
Copper pyrites	4·20
Spathose iron	3·85

While galena ought to be easily separated from any minerals in this list, the other four approach each other so closely that unless their densities can be altered, or the laws of gravitation suspended, they must remain mixed in spite of any *hydraulic* dressing process. If "those interested" like to send me small samples of mixtures of the above ores I shall be happy to inform them whether they are adapted for my process.

FREDK. J. KING.

Bishopsgate Avenue, Jan. 11. ——

BURROW AND BUTSON MINING COMPANY.

Sir,—Will you permit me to enquire if any of your readers can say what has become of the above mine? The company was formed in July, 1872, and in the prospectus we were led to expect dividends of 80 per cent. after 5000l. had been spent on the mine and machinery erected, but up till this moment these flattering prospects remain unfulfilled. We used (up to a few months ago) to get a fortnightly report in the Journal of the progress at the mines, but this has been discontinued, and the shareholders generally are left in entire ignorance of the position of matters. In September last a circular was issued by some of the directors, in which it was proposed that legal proceedings should be taken regarding the formation of the company, but whether this has been done or not we have not been informed. Is the mine still being worked? how do matters really stand? are questions which perhaps some of your readers can answer for the information of the unfortunate shareholders.—*Newcastle, Jan.* 13. ONE OF THEM.

[For remainder of Original Correspondence, see to-day's Journal.]

FOREIGN MINING AND METALLURGY.

The great pre-occupation in the Belgian coal trade during the last few days has been a strike in the Belgian centre basin. The question which has been discussed with a certain anxiety is, "Will the strike extend into other basins, or will it remain a purely local affair?" Mutual concessions will have to be made on either side to secure a return of friendly feelings—or something like friendly feelings—between employers and employed. The Belgian collieries which the strike has not affected have been making large deliveries, —deliveries which have, however, been somewhat checked by inadequate and badly distributed supplies of rolling-stock on the local railways. M. Tercelin has called the attention of the Belgian Senate to the rolling-stock now possessed by the Belgian State Railways. M. Tercelin estimated that for the next five years the administration of the Belgian State lines ought to expend at least 800,000l. per annum for more rolling-stock.

The balance-sheet of the Creuzot Ironworks for the last financial year, recently presented at a general meeting, shows that an expansion of business has followed the reduction of prices, but also indicates that the profits earned have been less than in the year 1873-4. The sales for the year 1874-5 amount to 2,400,000l., being an increase of 200,000l. on the preceding year. The exports amounted to 880,000l. The profit is put down as 186,400l., being 80,000l. less than in 1873-4. The dividend is 50 fr. per share, against 70 fr. in the preceding year.

There has been little change in the Belgian iron trade, orders are scarce, and are keenly competed for. MM. Rolin and Co., of Braine-le-Comte, have obtained a contract for 20 locomotive tenders, for the Belgian State Railways, at 402l. The works of the Montigny-sur-Sambre Blast-Furnaces and Rolling-Mills Company are about, it is said, to be offered for sale. The attendance at the last metallurgical bourse meeting at Brussels was less than usual, and transactions were in a dull and languishing state. The bourse appears to be less and less attended by the managers of the great Belgian companies, who are content to be simply represented by their commercial agents; these latter are rarely authorised to conclude transactions offhand, and hence a good deal of valuable time is lost. The imports of steel of all kinds into Belgium in the first 11 months of last year amounted to 4900 tons, arms were also imported to the aggregate value of 275,289l., minerals to the extent of 764,129 tons, pig to the extent of 131,478 tons, and manufactured iron of various kinds to the extent of 14,121 tons. These totals, when compared with those for the corresponding period of 1874, show a diminution of 4190 tons in the imports of steel; a falling off of 28,216 tons is also to be noted in the imports of pig. On the other hand, there has been an augmentation of 77,000 tons in the imports of minerals, and an increase of 136,120l. in the value of the arms imported. As regards exports from Belgium in the first 11 months of last year, those of steel amounted to about 6000 tons, showing an increase of 1560 tons, as compared with the corresponding period of 1874. Arms were exported to the aggregate value of 660,141l., showing an increase of about 60,000l., as compared with the corresponding period of 1874. Minerals were exported in the first 11 months of last year to the aggregate extent of 833,220 tons. The exports of pig amounted to 14,194 tons, or about the same total as in the corresponding period of 1874. The exports of manufactured iron of every description were 191,800 tons; in this total rails figured for 55,380 tons, plates for 21,600 tons, and rails for 10,689 tons. The exports of rails presented a decline of 29,344 tons, as compared with the corresponding period of 1874; there was also a diminution of about 3000 tons under the head of plates. The best clients of Belgium last year for iron were the Low Countries, which took, Nov. 30, 37,896 tons; Great Britain, which took to the same date 30,375 tons; France, 23,417 tons; Switzerland, 21,175 tons; Russia, 19,604 tons; the Zollverein, 19,299 tons; and Italy, 14,281 tons. The over-sea relations of the Belgian iron trade are extending, but at a comparatively slow rate.

There is nothing very novel to notice in connection with the French iron trade. Messrs. Cail and Co., the great Parisian Mechanical Construction Company, realised last year a profit of 56,360l.; the new year has also commenced with work on hand to the amount of 200,000l. The company has branches at Brussels, Douai, Denain, and Valenciennes, but Paris is the principal seat of its operations.

It appears from official returns that in the first 11 months of last year 612,000 tons of coal were imported into Belgium, as compared with 398,000 tons in the corresponding period of 1874, and 590,000 tons in the corresponding period of 1873. The imports of coal into Belgium from Great Britain have been steadily increasing during the last two years; in the first 11 months of last year these imports amounted to 272,000 tons, against 209,000 tons in the corresponding period of 1874, and 186,000 tons in the corresponding period of 1873. The imports of coke into Belgium in the first 11 months of last year amounted to 17,000 tons, as compared with 6900 tons in the corresponding period of 1874, and 23,000 tons in the corresponding period of 1873. The exports of coal from Belgium in the first 11 months of

last year amounted to 3,900,000 tons, against 3,600,000 tons in the corresponding period of 1874, and 3,900,000 tons in the corresponding period of 1873. The exports of coke from Belgium in the first 11 months of last year were 592,000 tons, as compared with 514,000 tons in the corresponding period of 1874, and 752,000 tons in the corresponding period of 1873. Prince Joseph de Chemay has just transferred the Chartreuse Colliery, at Liége, to the Poirier Coal Mining Company, of Montigny-sur-Sambre.

MIDDLESBOROUGH AND SCOTCH IRON.

SIR,—At the beginning of last year we had the pleasure of handing you a few comparative statistics of the Cleveland and Scotch pig-iron trades up to Dec. 31, 1874, and we take the opportunity of presenting to your notice the relative figures at the end of the year that has just closed. In doing so, we regret that we are unable to record a gratifying retrospect of the trade, the low average selling price of iron, and the commercial disasters that have occured, having been alike prejudicial to the interests both of makers and merchants. We commenced the year with Middlesborough pig iron at its highest point—say, 58s. for No. 3, from which it gradually declined to about 48s. in August, after which at the end of September there was a smart reaction to 54s., when the price again gave way to 48s.; but at the end of the year it closed better, nominally at 51s.

The course of the manufactured iron trade exhibited a steady decline, prices becoming more and more unremunerative to makers, with a deplorable absence of demand, especially for rails. Towards the end of the year, however, ship plates brought better prices, and still continue to do so. In rails and bars scarcely any improvement can be recorded; but with engineers and ironfounders trade has been steady, and orders fairly plentiful.

In the Scotch pig iron trade the demand for consumption and export has been steady, and the price of warrants has fluctuated from 77s. in January, to 57s. 6d. early in June—the average price for the year being 65s. 9d. As in this market, prices advanced in December, when a better feeling set in as to the prospects of the spring trade, and warrants closed at 64s. 9d. on the 29th ultimo. We do not, however, consider the present position of the trade sufficiently clear to warrant us in making any prediction as to the prospects for the present year. We commence it with a somewhat improved tone as to pig iron, and a greater disposition on the part of consumers to contract for forward delivery; while, on the other hand, there is apparently no substantial improvement in rails or bars, the former of which is the great staple of the district.

Our market to day has been steady, with a fair business done, both for early and forward delivery, at higher prices than we have recently quoted. Manufactured iron, however, with the exception of plates, has not yet responded to the apparently improved position of pig iron.

The Scotch shipments for the past week are 4980 tons, against 9139 tons shipped during the corresponding week of last year.

Middlesborough-on-Tees, Jan. 11. —— I ANSON, ARMSTRONG, AND CO.

No. 1 G.M.B. Middlesborough pig iron, f.o.b. Tees			Per ton net 58s.
No. 2	ditto	ditto	54s.
No. 3	ditto	ditto	53s. 6d.
No. 4 foundry	ditto	ditto	52s. 6d.
No. 4 forge	ditto	ditto	52s.
Mottled	ditto	ditto	51s. 3d.
White	ditto	ditto	50s. 9d.
Rails	£6 15 0 to £7 0 0		Less 2½ per cent.
Ship plates	8 0 0 to 8 5 0		
Angle iron	7 7 6 to 7 12 6		
Bar iron	7 2 6 to 7 5 0		
Puddled bars	5 2 6 to 7 5 0		

M.ns. Scotch warrants f.o.b. Glasgow, 66s. 3d. cash.

CLEVELAND.

Furnaces in blast, Dec. 31, 1874	125	
,, out of blast, Dec. 31, 1874	30	— 155
Furnaces in blast, Dec. 31, 1875	116	
,, out of blast, Dec. 31, 1875	43	— 159
Stock of pig iron, Dec. 31, 1874	Tons 89,737	
,, 1875	74,258	
Decrease		15,479
Production in 1874	2,001,233	
,, 1875	2,047,763	
Increase		46,530

SCOTLAND.

Furnaces in blast, Dec. 31, 1874	121	
,, out of blast, Dec. 31, 1874	36	— 157
Furnaces in blast, Dec. 31, 1875	113	
,, out of blast, Dec. 31, 1875	42	— 155
Production for 1874	Tons 806,000	
,, 1875	1,050,000	
Increase		244,000
Stock of pig-iron, Dec. 31, 1874:—		
In makers' hands	Tons 62,125	
In storekeepers' yards	33,875	— 96,000
Stock of pig iron, Dec. 31, 1875:—		
In makers' hands	106,701	
In storekeepers' yards	63,299	— 170,000
Increase		74,000

THE QUICKSILVER MARKET.

The "Alta California," in an article assuming the probable suspension of several of the less productive quicksilver mines, unless there is soon an improved demand for the metal, with consequent increase in value, says:—

The New Almaden is producing about 900 flasks per month, the Redington 600, the New Idria 500, the St. John's and the Great Western each 400, and others less. The yield of the New Almaden and New Idria, south of the Bay, is equal to that of the others in Solano and Napa counties. The smaller mines north of the Bay are much more productive than those to the south of it. The St. John's Mine is putting up a new furnace, and will contend for the second place with the Redington next year.

On Oct. 1 the stock held by the Rothschilds in London was 3400 flasks. There was no Australian, and only about 300 flasks of Italian in the market. The supply, therefore, exceeded but little the usual monthly consumption of England for export and home use, which may be put down at 3500 flasks. The production, outside of California and Mexico, is ascertained to have been as follows, in 1874:—

Spain	Flasks 36,000
Austria (Idria)	8,000
Italy	2,700
Germany	2,100
Borneo	2,000 = 50,800

It is estimated that the production for the current year will be about the same amount. The yield of California is valued at 40,000 flasks, and that of Mexico at 2200. This would raise the world's supply for 1875 to 93,000 flasks. The world's consumption varies between 80,000 and 90,000 flasks, according to the price of the metal. The greater the decline the more consumption is stimulated thereby, since less valuable ores can then be treated to advantage.

California's export from Jan. 1 to Oct. 1.

By Sea:—	1874.		1875.
To New York	Flasks 75		287
Mexico	2825		3,320
Chili	404		355
New Zealand	41		183
Bolivia	134		—
China	300		11,208
Japan	161		709
Central America	9		17
British Columbia	2		17
England	—		100
Other South American places	200		2,024
Australia	—		415
Calcutta	—		10
Asiatic Russia	—		3
Overland	—		2,850
Total	4151		21,398

The lower value this year has especially stimulated export to China, and it is difficult to determine what China may absorb at a certain price, their uses of the metal being both varied and extensive. The average annual range of values in cents, gold, per pound in California, since 1858, has been as follows:—

1859	49c.	1867	46c.
1860	40	1868	41
1861	42	1869	42
1862	43	1870	43
1863	50	1871	99
1864	54	1872	80
1865	55	1873	98
1866	47	1874	$1·38

This makes the average of the 16 years 60c. per lb., while during the first ten months of the present year it was on an average 80c.

From the foregoing the following conclusions may be arrived at: That although the Rothschilds, through the renewal of their contract with Spain, have retained the control of 36,000 flasks out of the 93,000 now produced, the rapidly increasing yield of California tends to remove the control of the market from London to San Francisco, where it is again regulated by demand from China. Although the telegraph links all these places, the real future of values turns upon California production, and not upon speculative combination at either centre, for the growing magnitude of our domes- yield has now become overshadowing.—*Iron Age* (New York).

COPPER AND TIN STATISTICS.

Messrs. James and Shakspeare—COPPER: The following tables show the statistical position:—

	Tons. 1876.	Tons. 1874.	Tons. 1873.
IMPORTS.			
Copper in ore	7,423	6,847	7,324
Ditto in regulus	15,810	12,272	13,712
Ditto in bars, cake, and ingots	36,296	34,928	31,645
Total	59,529	54,047	52,681
Imports for November only	3,986	3,554	5,176
EXPORTS.			
Foreign copper	13,520	23,102	19,026
Raw English copper	10,402	10,096	12,135
Manufactured copper	10,600	9,897	9,685
Yellow metal	12,635	13,040	10,599
Brass	4,162	4,812	3,704
Total	51,319	60,947	55,149
Exports for November only	4,648	5,194	5,009

Stocks in England and France (reduced to pure copper), also Chili chartered and afloat for same:—

		Jan. 1. 1875.	Dec. 1. 1876.	Jan. 1. 1875.	1874.
Liverpool and Swansea.	Chili—in ore, regulus, and barilla ....Tons	999	1,035	718	999	3,123
	Chili—in bar and ingot	10,831	11,477	11,682	10,831	18,247
London	Foreign copper, chiefly Australian	4,492	7,192	6,150	4,492	5,467
	English copper	73	50	50	73	127
Havre	Chili bar and Barilla	3,413	855	1,647	3,413	1,680
	Other foreign	950	230	200	950	200
Actual stocks		20,758	20,839	20,447	20,758	28,844
Chili, chartered and afloat		9,054	8,337	7,895	9,054	7,271
Gross total		29,812	29,176	28,342	29,812	36,115

The following were the imports—Jan. 1 to Dec. 31:—	1875.	1874.	1873.
West Coast copper into England and France ....Tons	49,300	45,485	40,441
Other foreign	13,284	12,091	12,314
Total	62,584	57,576	52,755
In December only:—West Coast copper ....Tons	4,108	3,321	2,038
Other foreign	253	90	413
The following were the deliveries from stock in England and France—Jan. 1 to Dec. 31 ....Tons	62,895	65,643	56,662
During December only	4,753	3,338	3,306

The direct imports from the West Coast of South America into England during the month of December were equal to 3,263 tons pure; into Havre, 845; during the same period 153 tons of other foreign copper entered the port of London, and 100 tons went into Havre, making altogether a total of 4361 tons. The mails received here from Chili during December advised charters for together 3992 tons, against 5621 tons during December, 1874, and 3068 in December, 1873. During the past year 48,322 tons have been so advised, against 48,525 tons in 1874, and 41,221 tons in 1873.

TIN.—English is unaltered, but the market has a slight downward tendency. Foreign has dropped about 1s. per cwt. This fall, however, has brought forward rather more enquiry, and a slight concession on present rates would appear likely to induce speculative operations. The Banca sale has been declared at 23,10 slabs for the 28th instant. The following statistics show the position of this metal:—

	Jan. 1. 1876.	Dec. 1. 1876.	1875.	1874.
Stock of foreign in London ....Tons	2897	5950	6018	2897	2038
Banca in Holland (in second hands)	488	1117	811	488	614
Billiton in Holland	1053	823	989	1053	857
Actual stocks	4438	7890	7818	4438	3509
Straits afloat for Europe	1586	665	1010	1586	510
Billiton ditto	699	700	932	699	364
Australian ditto (estimated)	1350	1450	1800	1350	1061
Gross total	8073	10705	11600	8073	5444
Banca tin in the hands of the Dutch Trading Company:—					
Unsold in warehouse ....Tons	3738	1920	2061	3738	3592
Afloat for Holland	297	300	376	297	365
Total ....Tons	4035	2220	2437	4035	3957

Foreign tin brought to market in London and Holland between January 1 and December 31:—	1875.	1874.	1873.
Sales of Banca by the Trading Company.....Tons	4273	4046	4227
Imports of Billiton	2832	2829	2519
Imports of Straits	8729	4054	4986
Imports of Australian in tin	7133	4060	429
Metal	22977	15039	12161
Imports of Australian, pure, in ore	39	2487	3088
Gross total	23016	17526	15249
For December only	1220	1301	1419
Deliveries of foreign tin in London and Holland, including Australian in ore Jan. 1 to Dec. 31...Tons	19636	16597	14267
During December only	1292	1171	145

The exports of English and foreign tin, according to the Board of Trade returns, were from January 1 to Nov. 30:—	1875.	1874.	1873.
English ....Tons	4865	7310	5255
November only	318	440	406
Foreign	4085	2189	1319
November only	519	128	164

Messrs. Sanford and Bird say—"In our circular at the commencement of last year we remarked upon the probability of large supplies of tin during 1875. This view has been verified, as we find the total imports to be about 6000 tons in excess of 1874, and about 8000 tons in excess of 1873. This is accounted for chiefly by the large shipments from the Straits, the production in Australia having kept up well, but not showing any marked increase. The price of foreign tin shows a fall of about 15*l.* per ton as compared with last January, and at one time it fell to 75*l.* per ton, or a fall of 20*l.* per ton, but it subsequently rallied, and for the last two months the market has remained steadier in tone. We do not attempt to express any opinion as to the future course of the market, as prices will, we expect, depend entirely upon the monthly shipments from Australia and the East. The continued fall in the prices of tin-plates has been more marked than in any other article, and for some months past values have ruled comparatively as low, if not lower, than has ever been known. This is to be accounted for more through over-production than from want of demand, as statistics will plainly show that the export trade is steadily increasing, and from personal knowledge we find home consumption is larger than ever. With regard to the future of tin-plates we can only say that their selling price so nearly represents the cost of manufacture that any increased demand, which we naturally look for as the spring advances, will most certainly raise the prices, and help to give the manufacturer the profit he has so long and patiently waited for. The rapid development of our colonies and a good home demand combined to keep the prices of galvanished sheets and other articles very firm and steady, while other branches remain dull; and we see no reason to anticipate any fall in prices while the demand continues, as it does, fully up to our powers of production.

Messrs Sanford and Bird have also prepared an elaborate statistical table giving some interesting particulars with regard to the tin and tin-plate trades. It appears that the exports of tin plates from the United Kingdom were 120,638 tons in 1873, 122,960 tons in 1874, and 138,563 tons in 1875. The exports of English tin from the United Kingdom was 115,150 cwts. in 1873, 154,613 cwts. in 1874, and 104,440 in 1875. With regard to foreign tin the figures were—in 1873, exports 28,869 cwts., imports 155,424 cwts.; in 1874, exports 47,373 cwts., imports 184,377 cwts.; and in 1875, exports 84,475 cwts., imports 335,481 cwts.

THE ANTIMONY MINES IN QUEENSLAND.

Amongst the many valuable mineral properties worthy the attention of capitalists that exist in the district are the antimony mines of Neardie. They are situated 40 miles by road from the town of Maryborough, and 23 miles from Tiaro, or head of navigation of the Mary river. The surveyed railway line to Gympie passes the mines within 12 miles. There are five 80-acre and two 20-acre blocks that have been proved, and the owners are now in possession of their title deeds from the Crown; but out of the seven blocks, consisting of in all 440 acres, only one block is being worked by a small company, the others are waiting until the time comes when liberal capital will offer itself to work the properties, probably as an amalgamated company. Some hundreds of tons of ore, averaging over 60 per cent, have been raised and shipped to Brisbane, Melbourne, and England. Assays have been made in Gympie, Maryborough, Brisbane, Sydney, Melbourne, Ballarat, and London—all agreeing that the ore is of the purest quality known in the world, being entirely free from arsenic, lead, or any other deleterious ingredient. One large sample of star regulus from this ore was manufactured at the Bulimba Smelting Works, near Brisbane, and was pronounced by competent judges to be equal to the best English, and superior to any Australian samples hitherto produced. The writer can vouch for it that all the parties owning the various blocks, including the one being worked by the company, will willingly part with this splendid property for a fair consideration to a capitalist or company, so that it can be worked in the manner it deserves. The known lodes are three, besides many leaders, all very rich. What is really required is a set of furnaces, and the various blocks systematically mined, so that 200 to 300 tons of ore would pass into star regulus per month. The property is situated in an extraordinary rich patch of forest timber. The returning drays from Gympie at present carry the ore to Maryborough, under contract, for 1*l.* 17s. 6d. per ton. Traces of gold was the result of the London assay, and gold, both in quartz and alluvial, is found extending from these mines to Gympie, and beyond it. The Gympie gold field is about 11 miles, as the crow flies, from it. The general opinion is that not only gold but antimonial silver in large quantities will be found in the lodes. For the Philadelphia Exhibition some blocks, equal to from 65 to 70 per cent., were raised, weighing respectively 4 cwts., 6 cwts., and 8 cwts.; but, unfortunately, the unprecedented rainy season we experienced just at the time for closing the list of exhibits prevented these large and pure specimens from competing with the world for the medal. It is to be hoped that at the next world show Neardie will not be behind hand.

In the vicinity of Kilkivan are found deposits of a conglomerate ore of almost fabulous richness, containing gold, silver, copper, wolfram, and other metals, the difficulty of turning which to practical account has proved very tantalising to claim-holders. One of the selections, known as the Mariner's Reef, is at present in working, the ore being shipped in its crude condition to Germany, where alone the combined metals can, by a series of intricate processes, be dissociated to advantage.—*Maryborough Chronicle*, Oct. 23.

Meetings of Public Companies.

WEST CHIVERTON MINING COMPANY.

A special general meeting of shareholders was held at the offices, Gresham Buildings, Basinghall-street, on Monday,

Mr. R. SMITH in the chair.

Mr. G. SHARP (secretary) read the notice convening the meeting.

The CHAIRMAN said the meeting was merely a formal one; there had been some little doubt as to the 300*l.* annual remuneration voted to the committee at the last meeting, and, as the committee did not wish to take the least advantage of that, they had thought it much better for their own sakes, as well as the shareholders, to afford an opportunity to confirm that resolution or otherwise, as they might think proper. The committee had received communications from several shareholders upon the subject, and, wishful that their co-shareholders should fully discuss the question, had called this meeting. A Glasgow shareholder had written to him (the Chairman)—he did not know whether a large shareholder or not—but his letter seemed to embody the idea of the committee. It was as follows:—

I write simply to state that, in my opinion, the sum that may be deemed sufficient remuneration for the committee should be paid annually and voted and paid annually; but that the whole of the circumstances of the mine should be looked at previously to being voted. I do not object to the vote being retrospective.—J. MOYER: *Jan.* 6.

The CHAIRMAN said as far as the committee were concerned they regarded that as a fair proposition, because they would be sorry to take any fees if the mine were not paying good dividends—certainly they should not think of taking any remuneration if the West Chiverton did not return a very fair dividend, equal to at least the last dividend. He was sure his brother committeemen would support that view, because neither of those gentlemen were in circumstances that they would take anything except the mine was a paying concern. The committee, therefore, submitted that in place of the resolution passed at the last meeting the following resolution should be passed—"That the sum of 300*l.* paid to the committee at the last meeting be hereby confirmed as far as the retrospective part of it goes, and that the future remuneration shall be voted in general meeting as the shareholders may think fit." By that resolution it would be open to the shareholders to discuss the question at future meetings, and consider the services of the committee, whether they were worth anything or not.

Rev. Mr. HEARD seconded the proposition. He thoroughly confirmed the remarks of the Chairman relative to the committee in not receiving anything unless the mine should be in a paying condition. Several letters received from the country criticised to some extent the resolution previously passed. The feeling of the committee was the question of remuneration should be brought annually before the shareholders; the feeling of the shareholders was that the committee should receive 300*l.* for their past services up to the last meeting, and that the services for the present year should be considered, and the remuneration awarded at the end of the year, when the shareholders had received a dividend; and when they could consider whether the mine was fairly prosperous, and the committeemen had discharged their duty properly.

A SHAREHOLDER asked how many there were on the committee?—The CHAIRMAN: Three. He wished to say, not in a boastful spirit, that the shareholders would be able to judge for themselves as to the large amount of work involved in the resuscitation of West Chiverton Mine; it had been a work of some magnitude to take into consideration the dilapidated condition in which the present committee had found the mine, and he thought the shareholders would consider that the efforts of the committee had been attended with success. They had got the dues reduced from 1-15th to 1-20th, and when the present committee took office the concern was really bankrupt, and he and Mr. Sharp passed their words to the bankers that they would see them paid, and there were many other things he would not go into at the present meeting. The committee were working hard to get the mine restored to its proper position; he believed from the expressions he had heard from the shareholders at large they considered their conduct had been in the highest satisfactory.

Mr. BEASLEY asked whether the meeting could legally pass such a resolution, and whether especial notice should not have been given of it. Notice had been given of a certain resolution, but it differed from that now before the meeting.

The SECRETARY said the wording of the notice was to the effect to pass the resolution referred to therein or "otherwise."

The CHAIRMAN pointed out that a future meeting would be necessary to confirm the resolution now under discussion.

Mr. BEASLEY did not oppose the resolution, but simply wished it to be legally carried.

During the discussion which ensued it was suggested that possibly the views of some would be met by leaving out the latter portion of the resolution, which would then stand thus:—"That the sum of 300*l.* be voted and paid to the committee for their past services."

The CHAIRMAN pointed out that would leave the question open to the shareholders to vote the remuneration annually at the meetings. He also pointed out that at the first meeting held at the London Tavern, when the committee took office, it was proposed they should be paid at the end of the year, and that the remuneration should be left to the annual meeting; they took office upon that understanding, if the mine did not pay their services should not be remunerated.

Rev. Mr. HEARD had received letters from shareholders approving the course now suggested.

The resolution as altered was put and carried unanimously.

A vote of thanks to the Chairman closed the proceedings.

EAST POOL MINING COMPANY.

The two-monthly meeting of shareholders was held at the mine, on Monday, under the presidency of Mr. J. G. DENNIS, of Liverpool, who holds about a fourth part of the mine. There was a large attendance of shareholders.

The CHAIRMAN felt pleased to be able to present what he regarded as a most favourable statement of accounts. The labour costs for September and October were 2847*l.*, the merchants' bills for October and November 1356*l.*, bankers' charges 91*l.*, dues to Mr. G. L. Basset 364*l.*, and transfer for providing for the thirteenth month. Copper ore had been sold during October and November realising 1106*l.*, tin during Nov. 17 to Jan. 5 2597*l.* and tinstone 1560*l.* On account of sales of arsenic 900*l.* had been received, and 40*l.* had been received from the sales of wolfram. The total credits were 6408*l.*, and the balance of profit was 1398*l.*, which with the 130*l.* from the last account made a balance of 1528*l.* to be dealt with. Out of that sum the committee propose to declare a dividend of 4s. 6d. per share. This would absorb 1440*l.*, leaving 88*l.* to be carried to the credit of the next account. He felt sure all would agree with him that this was a gratifying accomplishment for the past two months. What was likely to be done in the future was indicated in the following report from Capts. Maynard, Bishop, and Tippet:—

Great Lode.—The 180 is driven east of engine shaft 48 fms., and is worth for tin 15*l.* per fathom. We are now within about 10 fms. of the barrier, and have commenced to drive south through the lode to cut the south lodes. The 180 is driven west of cross-course 9 fms., and is worth for tin 18*l.* per fathom. We have five stopes working in the back of this level, worth on an average 18*l.* per fathom each stope. The cross cut is driven south at this level about 7 fms. We have now increased two men at this piece. The sump-winze is sunk about 4 fms, and is worth for tin 19*l.* per fathom. At the 170 east we are putting up a rise to communicate with the 160, which we hope to complete this month. The rise is worth for tin 8*l.* per fathom. We have two stopes in the back of this level, worth for tin 10*l.* per fathom each stope. In the 160, east of shaft, we are sinking a winze to communicate with the above mentioned rise, and is worth for tin 8*l.* per fathom.—Engine Lode: In the 170 fathom level we have commenced to drive west on this lode to communicate with the 180; not much to value. In the 160 we have two stopes in the back of this, and worth for tin 18*l.* per fathom. The 155, driving east, is worth 9*l.* per fathom.—South Lode: The 160 end west is suspended. The 160 is driven east of long winze 22 fms., and is worth for tin 20*l.* per fathom. The 150, east of eastern cross-course, is worth for copper and tin 10*l.* per fathom. The stope above this level is worth 10*l.* per fathom. The 140, east of long winze, about 16 fms., is worth for copper and tin 15*l.* per fathom. Two stopes in the bottom of this level are worth for copper and tin 10*l.* per fathom each stope. We have commenced to sink a winze about 14 fms. east of long winze at this level. There are eight stopes working in the back and bottom of the 130, worth on an average for copper and tin 14*l.* per fathom each stope. The 120 is driven east of cross-course winze 16 fms., and is worth for tin and copper 10*l.* per fathom.

In reply to Capt. Abraham James, the CHAIRMAN said there were only 9 tons of tin in stock. In his opinion it was not prudent to stock tin at all.

In answer to Mr. Rule it was stated that everything was charged up close.—Mr. RULE: I see you are paying 25s. a ton for Cardiff coal.—Mr. MARTIN (the purser): For the simple reason that we cannot get it for less.

The CHAIRMAN moved the adoption of the accounts and the declaration of a dividend of 4s. 6d. per share.

Mr. R. R. BROAD seconded the motion. Considering that there had been a drop in tin of 4*l.* a ton since the last account, he thought their present position was really wonderful. It was a great proof that they were working a mine destined to be still more prosperous than ever it was. If they could get 15*l.* more a ton for tin they would have a 6s. dividend.

The resolution was carried, and Capt. MAYNARD proceeded to give particulars concerning different points of the mine. Some had said that in passing they saw the whim standing still, but he believed their whim raised more than any other in the county. Having to put in a new cylinder and piston it was idle a week, but ever since that 15 cwts. of coal had been saved daily in working it. He hoped the next skips would be made larger, so that they might still be able to do more. Suggestions having been made that the western part of the mine should be worked, the matter had been looked into, but required further investigation before a decided answer could be given as to its advisability.

Mr. HARRIS thought it would be wise to leave the western ground till the other

important points were developed.—Dr. MITCHELL: The western ground will be something good for our grandchildren.—On the motion of Mr. HARRIS, seconded by Mr. RULE, the Chairman was cordially thanked.

Mr. DENNIS, acknowledging the compliment, said that necessarily from the large interest he held he took a very deep interest in the mine, and was at all times watching to see whether he could be of any advantage to it. He had every confidence in the mine, feeling it was only in its infancy. The more searching the questions they put to Captain Maynard the more convinced would they be that the more the mine was developed the richer would it become. The mine had great strength of character in discovering arsenic, wolfram, copper, and tin all mixed together, and he believed the deeper they went the better defined would the lodes become, the mine eventually turning out solely and wholly one for tin. East Pool was, in his opinion, going to turn like its neighbours—Dolcoath and Tincroft—and it was richer now than they were at the same depth. Next to a good mine they wanted good agents, and East Pool was well provided in this respect. (Hear, hear.) He would take this opportunity of proposing a vote of thanks to Capt. Maynard and his assistants, including the agents at the stamps. Capt. Maynard especially deserved their thanks for his foresight in cutting out the mine. The mine being principally at present a tin mine, the dividends depended a great deal on the economy practised. He could not take a sanguine view of tin at the present time. The little spurt in the summer was costing them 2*l.* now for every 1*l.* gained then. He would rather see tin at a low price for some time, so that they might ultimately have that permanent improvement which he believed would come within the next 12 months. With a better price for tin their dividend was bound to increase. Though theirs was not a copper mine, they had sufficient of that mineral to add sensibly to their credits. Copper was at a very good price and was bound to improve, for statistically it had not been in so good a position for years. There was an exceedingly good demand, and as the stocks were not increasing they might confidently expect a rise. As to arsenic, they must rest and be thankful, hoping to maintain the present good price. Occasionally they received small sums for wolfram, but he was much interested in the wolfram question, and having taken a great deal of trouble about it, he was convinced that shortly there would be a steady demand for this mineral, enabling them to dispose of all they raised at fairly good prices.

Mr. RULE seconded the vote of thanks to the agents. Owing to the economy exercised they were saving at least 80 tons of coal a month.

The motion having been carried by acclamation, Capt. MAYNARD thanked the shareholders for this expression of confidence. The mine never looked better, and if they could get a better price for tin and wolfram, maintain the present price for arsenic, and continue to practice economy, there were still brighter days in store.—Mr. BISHOP also spoke.—*Western Daily Mercury.*

AUSTRALIAN CENTRAL GOLD MINE COMPANY.

An extraordinary general meeting of shareholders was held at the offices, Austinfriars, on Wednesday, for the purpose of passing a special resolution authorising the directors to increase the capital of the company by the issue of 2000 shares of 1*l.* each, to be preferred in respect of dividends on the same terms as the present 10,000 preference shares already issued under the special resolution passed on Aug. 6, 1873, and confirmed on Aug. 25, 1873,

Mr. WINGROVE in the chair.

The London manager and secretary read the notice convening the meeting.

The CHAIRMAN said the directors had not received any information since that laid before the shareholders at the meeting a week or two ago. Since the circular had been in the hands of the shareholders 993 of the proposed 2000 shares had been taken, in anticipation of the same being created. The directors had not had a telegram from the mine, so they expected things were going on satisfactorily, but at the same time it was most desirable, considering the heavy interest they had to pay for the loan, it should be paid off by the shareholders.

Mr. FANSHAWE proposed—"The directors be and are hereby authorised to increase the capital of the company by the issue of 2000 shares of 1*l.* each, preferred in respect to dividend in the same manner as the 10,000 preference shares already issued."—Mr. RAIT seconded the proposition.

The CHAIRMAN, in reply to a question, stated that it was quite understood no portion of the new capital should go towards paying directors' fees.

A discussion ensued as to the necessity of filling up one vacancy at the board, the Articles of Association requiring that the board should never be less than four. It was understood the vacancy would be filled up, the board having full power to do so under the Articles. The resolution was put and carried unanimously.

A vote of thanks was passed to the Chairman and directors, which closed the proceedings.

IMPERIAL BRAZILIAN COLLIERIES COMPANY.

A special general meeting of shareholders, called in pursuance of a resolution passed at the adjourned meeting on Dec. 3, was held on Jan. 7 at the Cannon-street Hotel (Mr. JOHN O. SURTEES in the chair), to receive and consider proposals for the reconstruction of the company. A committee of debenture-holders and shareholders was then appointed to confer with the directors, and they now reported that they had agreed upon the following proposals:—

Having regard to the probable cost, both here and in Brazil, of constituting a new company, it is proposed that, instead of reconstructing the company, the existing organisation be preserved, and new 10 years debentures created to the amount of 25,000*l.* Such debentures to bear cumulative interest at the rate of 10*l.* per cent. per annum, payable out of profits. The present debenture debt and interest (amounting to 11,000*l.*) to be exchanged, at the rate of 75 per cent. for debentures of the proposed issue. The balance to be offered for subscription at the same rate among the present shareholders and debenture-holders.

The CHAIRMAN, in opening the proceedings, said that it was a long time before they could come to any arrangement. They had at first thought of starting a new company, and had gone so far as to print proposals to that effect, but they found that the cost of stamps and other expenses was very large, and perhaps to a certain degree endangered the concession from the Brazilian Government; and that it would be better to keep the present organisation in existence. They, therefore, proposed the scheme now before the meeting. The scheme had been sent to those interested, and a circular asking for an expression of approval or non-approval. The result was that they had received assents from 32 shareholders, representing 14,805*l.*, and 10 debenture-holders 1450*l.*, making a total of 16,255*l.* The dissenters were three shareholders and one debenture, representing 1525*l.* The residue had not thought fit to reply, and so they were completely in the dark as to their opinion. But "assenting" was one thing and cordially adopting a scheme was another thing, and he hoped the shareholders and debenture holders would not be content with assenting, but would put their shoulders to the wheel and subscribe the further amount necessary. If not, then it would be better to wind up at once. There was a letter from Mr. Tweedy, received two days ago, in which he said that if a better seam of coal could be reached, and there was every reason geologically that they had it below their workings, they would have the finest mining property in Brazil.

Mr. PIKE said that it was not likely fresh money would be subscribed on the proposed scheme, and moved a resolution to the effect that this meeting be adjourned for a month, and that meanwhile it be ascertained whether the debenture-holders will consent to postpone their securities, and if they so consent, then that preference debentures for not exceeding 8000*l.*, bearing a preference dividend at the rate of not more than 25 per cent. per annum, be issued.—The Rev. G. L. HORTON seconded the motion.—The CHAIRMAN said the debenture-holders would not do it.

Mr. DE LAUNOY complained that the interests of the original shareholders were utterly neglected in this scheme, and suggested that if they went into compulsory liquidation some of the money which had been expended might be recovered.

Capt. G. FOWLER said he was one of the largest holders of original stock, and thought the only chance there was of rescuing the property would be to adopt the scheme now proposed by the directors.

Mr. WEBB said the best answer to Mr. de Launoy was that the debenture holders if they thought any good could come to them by compulsory liquidation, would have placed the company in that state. He also condemned Mr. Pike's proposal of creating preference stock, as none of it would be taken up out of doors. The inducement to shareholders to take up what was now proposed was, that if the lower seam of coal was found they would reap nine-tenths of the benefits secured thereby, as their share in the capital was 90,000*l.*, and that of the debentures only 10,000*l.*

After considerable discussion the scheme of the directors was adopted, on the motion of Dr. GOODSALL, seconded by Capt. FOWLER, only one hand, that of Mr. de Launoy, being held up against it.

Mr. STOBB pointed out that all the statements as to the good seam of coal sought to be reached were speculative. If there were any good geological grounds for the existence of such a seam, a statement of them would do more to bring in new capital than any amount of preference.

The meeting then adjourned until Feb 7 next, and the directors were empowered to take measures for carrying out their scheme.

GAULEY-KANAWHA COAL COMPANY.

The adjourned general meeting will be held on Saturday, at which the report to be submitted states:—

They have been fortunate enough to obtain the assistance of Mr. Clarke, one of their number, to visit the company's property in America. This gentleman, who as a civil engineer has had much experience in the construction of railways in India, was accompanied by an engineering friend (Mr. Wall) specially acquainted with coal working. Mr. Clarke, after inspecting the colliery and railroad, has written to the board expressing his satisfaction. As soon as possible after his arrival his report will be forwarded to the shareholders. During the year the colliery has been further opened, and is understood to be in a condition to send away 100 tons per day—a quantity which may be rapidly raised to 500 as soon as regular workings begin. The railway has been completed, provided with the requisite plant, and was in carrying order for some time, during which samples of coal were sent to various markets. The value of the coal in the 11-ft. seam, which is now opened and is in thorough working order, has been established by trials on a tolerably large scale, both with regard to gas and coke; 10 tons tried at Staunton, a large town 140 miles from Hawk's Nest, produced 9500 cubic feet of over 17 candle-power gas per ton, and 20 tons coked in ovens such as commonly used in America gave a coke of excellent quality. As a house coal, and for general purposes, this coal cannot fail to attract buyers. The whole of the money hitherto raised has, with the exception of a very small percentage, been expended in the purchase of real estate, works of whose value there can be no question, railway and other plant and stores. They are assured on all hands that their position is now assured, and will before long be remunerative.

THE HIMALAYAN MINES.—A correspondent writes us:—"I understand the settlement of the Himalayah Mines has been arranged in this way. The Marquis of Salisbury, on being memorialised, ordered the proprietor to be reinstated in the property, and 'treated liberally,' as he considered he had been 'shamefully' treated. The Punjab Government then offered him new leases, on condition he would sign two documents exonerating that Government from all claim for compensation for damages and any losses he may have sustained by the stoppage of the mines. For peace sake, he signed the two documents in the presence of the Assistant-Commissioner in June last. Since then he has never been able to obtain the promised leases or any reply to any letter that he has addressed to them. Sir Louis Mallet, K.C.B., who says that the Marquis of Salisbury had been assured some months ago that the matter was settled, is now coming to India, and will probably enquire why the Punjab Government can do such iniquity and defy the superior Government. I am assured these are the plain, unvarnished details of the facts, but do not go into the anxieties attending this treatment by the proprietor and his family during the 18 months the matter has been pending." If such an act as that said to have been perpetrated by the Punjaub Government had been perpetrated by any private or non-official person in India he would have been brought to Court, heavily fined, and disgraced. Since the above appeared in the *Englishman Overland Mail* of Calcutta, of Nov. 26, we have been informed that the Lieutenant-Governor of the Punjaub had furnished defendant's leases of the mine to his Excellency the Viceroy for approval on Aug. 6 last. But his Excellency is not to be hurried just because a mining proprietor and his family, and a few hundred miners are on the brink of starvation. What cares he who starves? No more than he cares to see the statue of the beloved Lord Mayo offered for sale as old metal in Calcutta because there is no site for it! See Calcutta papers. For a certain when he was made Lord N. he was past bearing (Baring).

THE DISCOVERER OF GOLD IN CALIFORNIA.—It is a curious fact—or rather it would be curious in any other planet than this, which rather abounds in such cases—that the man on whose lands gold was first discovered in California is spending the last years of a long life in poverty and neglect. It was in General Sutter's mill-race, near Sacramento, that the precious metal was first seen by Americans. The General is a native of Switzerland, but went to the Sandwich Islands to cultivate oranges, and thence to the Pacific Coast of America, where he took a large tract of land under a Mexican grant, with the hope that the United States would some day stretch out to him. But the gold appeared, and the rush of miners trampled over his fields, killed his herds, and made desolation in place of the fair estate they had found. From that discovery came the most enormous tribute Nature ever paid to man. The present year's yield of gold in California cannot be less than $100,000,000 in specie, and while this immense run of wealth has been flowing for more than a quarter of a century, and great merchants and bankers have been made by its possession, poor old Sutter, on the brink of the grave, is unable to find an ear in which he can tell his story. He lives in a little cottage near Litiz, Pennsylvania, where he is educating his grand children at a German school, and, as he is more than 80 years of ago, there is no time to lose if he is to be indemnified at all for the losses he incurred at the time of the discovery. Somebody can surely afford to pay damages for the havoc made of the Sutter estate by the zealous worshippers of the golden calf.

THE NICKEL MINES OF NEW CALEDONIA.—Mr. John Higgenson, of Noumea, New Caledonia, threw open for inspection, on Monday, a large quantity of nickel ore from the celebrated Bellar Mine. The lot inspected is the second shipmeut from this mine, and consists of 150 hogsheads. It seems the ore from this mine is altogether a new ore, being a very pure sample of hydrate silicate of nickel, and it is said will assay a very high percentage. Mr. Higgenson, who is interested in a great number of the principal mines in New Caledonia, being very much dissatisfied with the returns received from England of ore from the Mont d'Or Mines sent home for treatment, has resolved to erect smelting works in Noumea. Commissioner Cluny, of the mining department in New Caledonia, has assayed a portion of the ore of the kind exhibited, the publication of which is reserved until Prof. Liversidge, the Rev. W. B. Clarke, Dr. Leibus (of the Mint), and Mr. J. G. Latta, have given their results. The intention of Mr. Higgenson, after getting assays from these gentlemen, is to have a consultation and learn if any difficulty exists as to the treatment of the ore. He has been assured already that no difficulty exists, that a simple smelting process should suffice, the ingredients being silica, water-nickel, with a tincture of magnesia and iron. The reports received from Europe as to the consumption of the metallic nickel are very encouraging. It is especially prized for its hardness and non-corrosive properties, and when brought into an oxide it produces colours used very extensively in fireworks, and in the manufacturr of French chintzes, cambrics, &c. The prices quoted range from 11s. to 12s. per lb., but probably that price cannot be obtained for large quantities. The proprietors of other nickel mines in New Caledonia look forward with great expectation to the enterprise of Mr. Higgenson in the erection of works, as they could then send home the metallic nickel, and get immediate advances either in Sydney or Melbourne. By the present system of exporting the ore we learn that results cannot be obtained for at least 15 months. It is said that there are at most not more than half-a-dozen nickel mines at work in the world. A large increase in the quantity produced would, of course, bring down the price, but on the other hand, a great cheapness of the article would increase its use in manufactures. In any case these nickel mines promise to be a great source of wealth to New Caledonia, and to help to increase the trade between that colony and Sydney.—*Sydney Morning Herald.*

QUARTERLY JOURNAL OF SCIENCE.—The original articles in the January number of this magazine embrace—A New Phase of Plant Life; Vegetarianism, the Great Dietetic Reform; Recent Chemical Researches, by M. P. Muir; Sidereal Astronomy, by Camille Flammarion; and on the Colouring of the Shells of Birds' Eggs, by H. C. Sorby; but by far the most interesting is the last, entitled "The Earliest Medical Work Extant," by Dr. H. Carrington Bolton, of Columbia College, New York, in which reference is made to a facsimile of an Egyptian medical treatise written in the 16th century, B.C., or, more exactly, 1552, B.C., so that it was written before the exodus of the Israelites, and when Moses was twenty-one years of age. The work bears internal evidence of being one of the six Hermetic Books on Medicine which are named by Clement of Alexandria 200 B.C. Amongst the different chapters may be mentioned those which relate to the preparation of medicine; of salves for removing the uhan; of the uses of the Tequem tree; medicines for alleviating the accumulation of urine and diseases of the abdomen, the book of the eyes, medicaments for preventing the hair turning grey, and for the treatment of the hair, medicines for forcing the growth of the hair, salves for strengthening the nerves, and medicines for healing the nerves, medicines for curing diseases of the tongue, medicines for the removal of lice and fleas, medicines for ears hard of hearing, and there is one chapter, the Secret Book of the Physician, which teaches the science of the beating of the heart, and the knowledge of the heart as taught by the priestly physician Nebsecht. The work abounds in prescriptions, one for sick bowels, directing that carraway seed 1-64 dram, goose fat ¼ dram, and milk 1 tenat (40 centilities) shall be boiled, stirred, and eaten. The notices of books is unusually full, but the notes on the progress of science have been somewhat neglected. The number is altogether a very good one.

"BUSINESS."—The handsome little volume by Mr. James Platt bearing this title, and just published by Messrs. Simpkin, Marshall, and Co., of Stationers' Hall Court, is one which might well be placed in the hands of every young man entering business, and one which, were its precepts followed by those already engaged in commercial pursuits, would tend greatly to increase the prosperity of the nation, and by enabling Englishmen to compete on more equal terms without disreputable dealing would confer equal benefit upon employers and employed. The work may be described as a popular sermon, somewhat in the style of the corresponding works of Benjamin Franklin, and will be read with equal pleasure. The several chapters into which the book is divided treat respectively of business, business qualities, health, education and observation, industry, perseverance, arrangement, punctuality, calculation, prudence, tact, truthfulness, integrity, money, and a few hints what to do with it, followed by some judicious concluding remarks, and a couple of pages of proverbs. The author has spared no pains to make the book thoroughly readable, and has so largely interspersed it with poetical extracts that it is really interesting, and might suitably be given as a present to the young of either sex, and thus be made to produce an important influence upon the business transactions of the rising generation by leading them to abandon the too commonly accepted maxim—"do others or they will do you"—to which Mr. Platt refers. The book is in every respect deserving of extensive circulation.

CALORIC ENGINES.—The engine invented by Mr. F. BROWN, of New York, consists of a fuel reservoir combined with a hot air furnace, and of an air jacket combined with doors leading one into the combustion chamber and the other into the ashbox of the furnace, and of a packing combined with a cylinder and plunger, the latter being provided with a concave bearing combined with a knuckle on the end of the piston-rod, which fits the said concave bearing, forming a receptacle for oil; and, lastly, of an air escape channel combined with an air-pump which branches off from the air channel leading to the air furnace.

ELECTRIC SUBMERGED LAMP.—A balloon-shaped glass vessel, protected by a metal cage is, according to the invention of Messrs. CHAUVIN, GOIZET, and AUBRY, of Paris, hermetically closed, preferably by an indiarubber plug. The plug is traversed by two metal rods isolated electrically. At the ends of these rods two ends of a platinum thread rolled into a spiral are fixed, which when traversed by the electric current is heated to incandescence and emits light. The generating pile is contained in a separate box, and conductors communicate the established current to the platinum thread.

EPPS'S COCOA—GRATEFUL AND COMFORTING.—"By a thorough knowledge of the natural laws which govern the operations of digestion and nutrition, and by a careful application of the fine properties of well-selected cocoa, Mr. Epps has provided our breakfast tables with a delicately flavoured beverage which may save us many heavy doctors' bills. It is by the judicious use of such articles of diet that a constitution may be gradually built up until strong enough to resist every tendency to disease. Hundreds of subtle maladies are floating around us ready to attack wherever there is a weak point. We may escape many a fatal shaft by keeping ourselves well fortified with pure blood and a properly nourished frame."—*Civil Service Gazette.*

BLAKE'S PATENT STEAM PUMP.

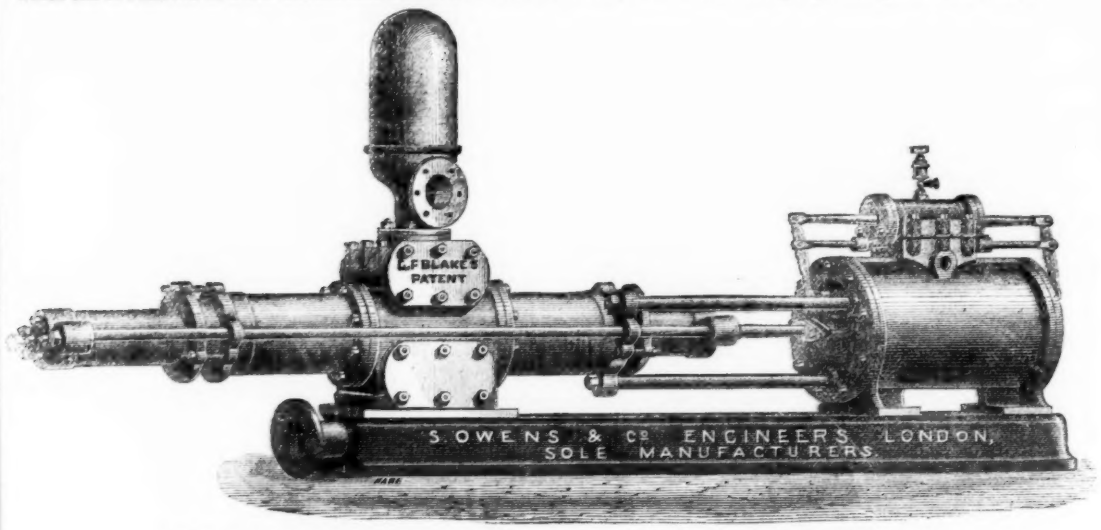
MORE THAN 8000 IN USE.

SOLE MAKERS FOR GREAT BRITAIN,

S. OWENS & CO.,

Hydraulic and General Engineers, Whitefriars-street, London;
And at 195, Buchanan-street, Glasgow (W. HUME, AGENT).

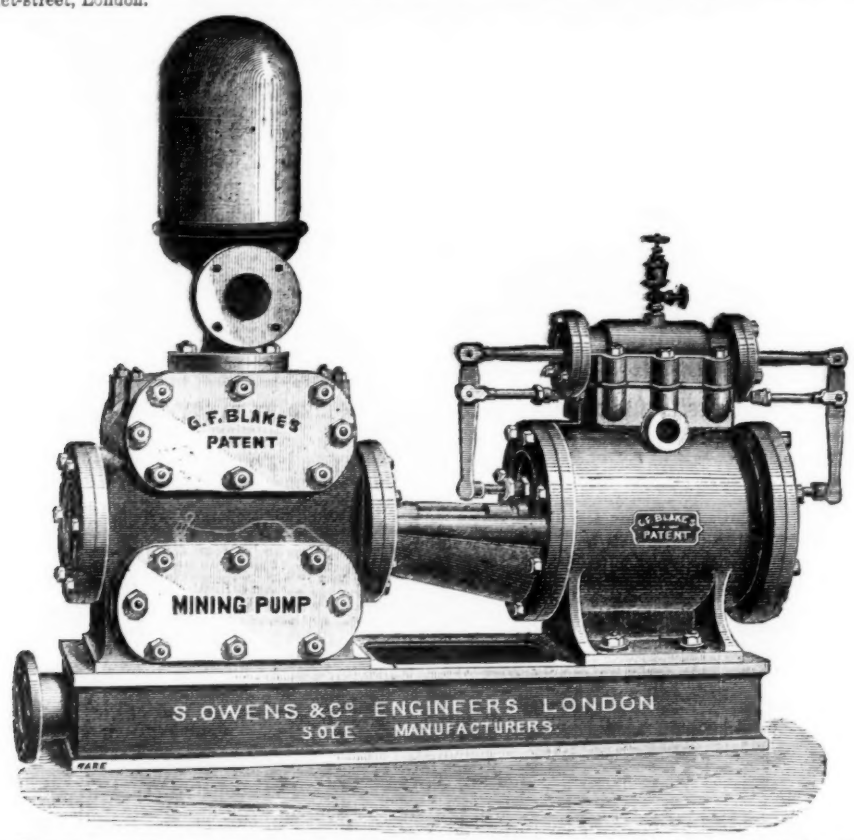
These PUMPS from their SIMPLICITY, RELIABILITY, DURABILITY, and ECONOMY are SPECIALLY SUITED FOR MINING PURPOSES, where large quantities of water require to be raised from great or medium depths with CERTAINTY. They are double-action in their construction, throwing a constant stream of water, can be made of any stroke to suit the space in which they have to work, can be arranged with any combination of steam and water cylinders to suit the pressure and lift against which it is desired to work them, are made of the very best materials and highest class of workmanship, and all working parts can be readily got at by any ordinary workman, and replaced if necessary by a duplicate part (all such being interchangeable) in the shortest possible time. For situations where gritty and sandy water has to be pumped the DOUBLE PLUNGER PATTERN is recommended. Where space is limited the PISTON PUMP is better suited, a novel feature of which is the PATENT REMOVEABLE LINING, which can be removed in a few minutes and substituted with a new one, without disturbing any other part of the pump.



Blake's Improved Double-plunger Steam Pump.

S. OWENS AND CO.,

In placing the BLAKE STEAM PUMP before the mining world, believe they are offering the BEST, MOST RELIABLE, and ECONOMICAL PUMP that has yet been made, and solicit an inspection of various sizes in operation at their works, Whitefriars-street, Fleet-street, London.



Blake's Improved Mining Pump, with Patent Removeable Lining to Pump Cylinder,

Any combination of these Pumps may be had to suit circumstances. The following are some of the SIZES SUITABLE FOR MINING PURPOSES:—

Dia. of steam cylinders.. In.	12	12	12	12	14	14	14	16	16	16	16	18	18	18	18	20	20	20	20	24	24
Dia. of water cylinders.. In.	3	4	5	6	4	5	6	4	5	6	8	4	5	6	8	5	7	8	9	6	8
Length of stroke ..... In.	18	18	18	24	24	24	24	24	24	24	24	24	30	30	30	30	30	36	36	36	42
No. of strokes per minute..	30	30	30	30	25	25	25	22	22	22	22	22	22	22	22	20	20	17	17	17	15
Quantity in gallons per hour, approxmately ...	1440	2610	4200	5940	2940	4620	6600	2646	4158	5940	10620	2646	5160	7500	13260	4586	9000	12360	15660	6720	12000

PRICES FOR THE ABOVE, OR ANY SPECIAL SIZE, AND ILLUSTRATED CATALOGUES FURNISHED ON APPLICATION

PATENT CONDENSORS

Can be supplied for any size pump to effect a saving of fully 30 per cent. in the consumption of fuel, greatly increasing their efficiency.

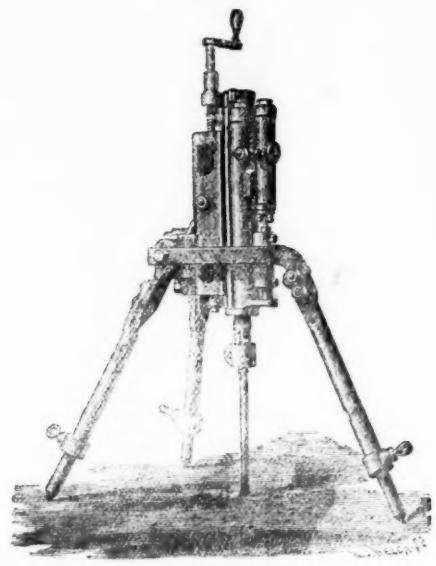
The Blake Pump will work under water, and as efficiently with compressed air as with steam.

BLAKE'S DONKEY PUMPS FOR FEEDING BOILERS KEPT IN STOCK.

THE "CHAMPION" ROCK BORER

For Tunnels, Mines, Quarries

AND OTHER WORKS.



The "CHAMPION" Rock Borer has been designed after years o experience of other Rock Drills; it surpasses them in their good qualities, and avoids their imperfections, and while being of the very best make and material, it is absolutely the cheapest in the market.

Intending purchasers can satisfy themselves of the excellence of this Rock Borer by seeing it in actual operation.

Improved Air-Compressors, &c.

ULLATHORNE & CO.,

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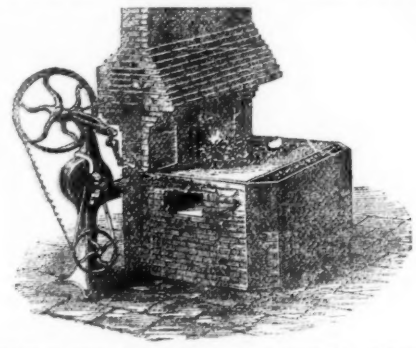

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More powerful and more easily worked than bellows, take up very little room, and require little fixing. Worked by hand, treadle, or overhead pulley.

Price, complete..... ... £7.

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IMPROVED

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MINERS' PICKS, with interchangeable Steel Points.

Semi-portable and fixed Winding, Hauling, and Pumping Engines.

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Full particulars, with prices and photographs, on application.

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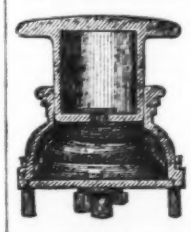

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CAST STEEL PISTON RODS, CRANK PINS, CONNECTING RODS, STRAIGHT and CRANK AXLES, SHAFTS and FORGINGS of EVERY DESCRIPTION.

DOUBLE SHEAR STEEL, BLISTER STEEL, SPRING STEEL, GERMAN STEEL,

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VIENNA EXHIBITION, 1873.

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CORNWALL POLYTECHNIC SOCIETY, 1867 and 1873.

TANGYE BROTHERS AND HOLMAN,

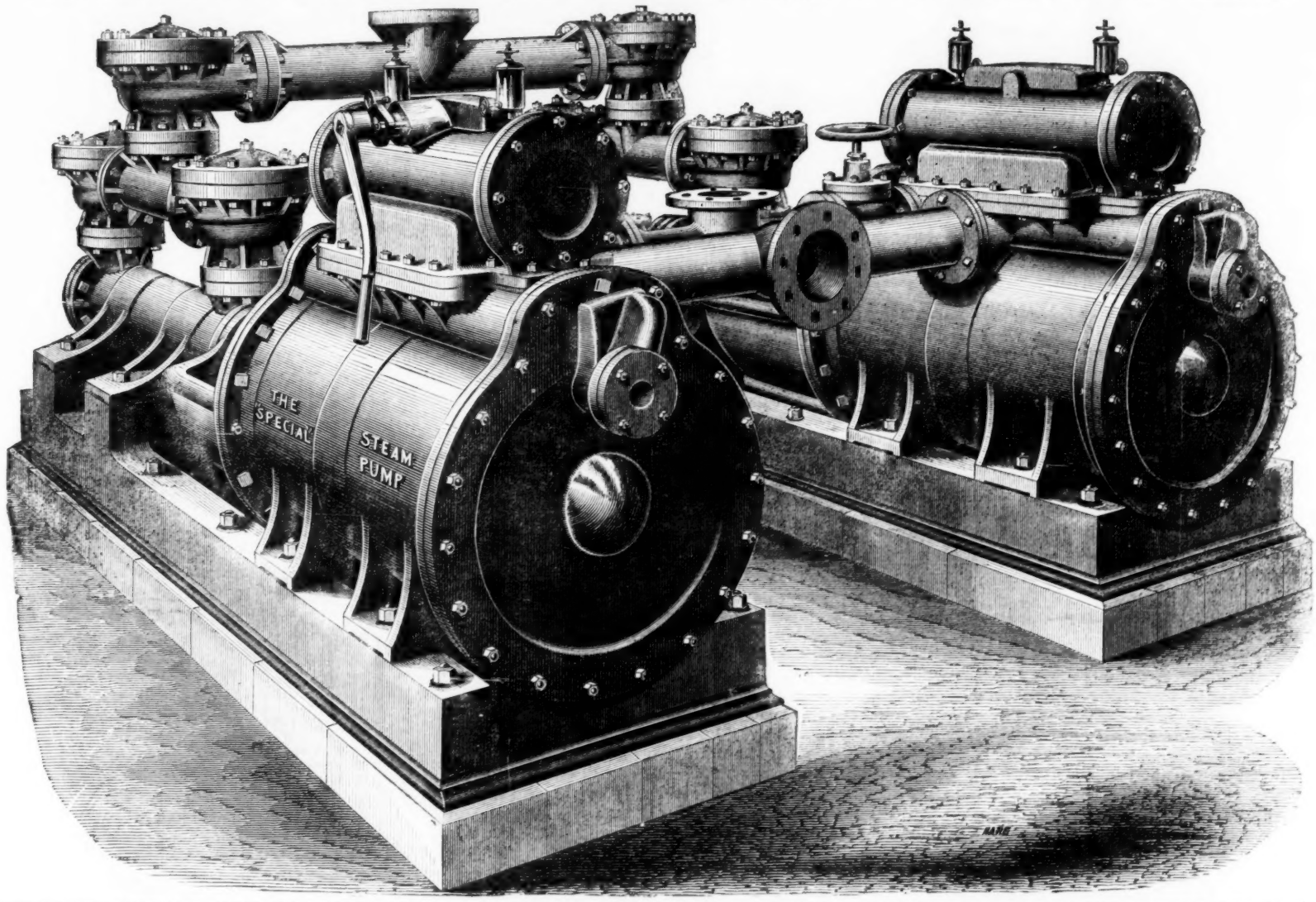
10, LAURENCE POUNTNEY LANE, LONDON, E.C.,

AND BIRMINGHAM, (TANGYE BROTHERS), CORNWALL WORKS, SOHO.

THE "SPECIAL" DIRECT-ACTING STEAM PUMP.

OVER **12,000** IN USE IN **ENGLAND** AND AMERICA.

SUCCESSFULLY ADOPTED IN A LARGE NUMBER OF MINES IN THIS COUNTRY AND ABROAD.



PAIR OF THE "SPECIAL" DIRECT-ACTING STEAM PUMPS SUITABLE FOR HIGH LIFTS IN MINES, SIMILAR TO MANY SUPPLIED BY TANGYE BROTHERS AND HOLMAN.

The following extracts from a letter, received by Tangye Brothers and Holman, from J. Bigland, Esq., dated Feb. 25, 1875, refers to a "Special" Direct-acting Steam Pumping Engine supplied four years ago to Messrs. Joseph Pease and Partners, for the Adelaide Colliery, Bishop Auckland. The engine is throwing about 8000 gallons per hour, 1040 feet high, in one direct lift:—

"The underground pumping engine at Adelaide Colliery is working night and day. It does its work satisfactorily, and gives us very little trouble. Some of the cup leathers which form the plunger packing have worked three months. The working barrel is in beautiful condition. The average duration of the valve seats is about eight months; they work and keep tight as long as there is a bit of them left. I expect the valves (Holman's patent) and the buffers will last as long as the colliery."

Extract from a letter received by Tangye Brothers and Holman from W. H. Eagland, Esq., dated Feb. 27, 1875, in reference to a "Special" Direct-acting Steam Pumping Engine supplied two years ago to the West Yorkshire Iron and Coal Company near Leeds, to throw 16,000 gallons per hour, 465 feet high in one direct lift:—

"It is at work night and day. Our man goes down to the pump twice a day (Ten A.M. and Four P.M.), to supply the tallow cups. After this it is left every day till he comes next morning, when he goes down again at Ten A.M. as before. The only repairs the pump has had for 12 months are one bucket, which had worked since we got the pump, and one valve seat, but no valve, so it has cost very little. Its first lift is 70 yards perpendicular, then the water passes up pipes for half a mile, ascending another 70 yards, and then another perpendicular pipe of 15 yards —total, 355 yards vertical height.."

Extract from the Official Report of the Commission of the German Empire on the Vienna Exhibition of the 1873, treating on Pumping Engines:—

"Contrary to these older pumping engines exhibited, there is now nearly everywhere the opinion established that the ("SPECIAL") pumping engines placed underground, which are made on A. S. Cameron's principle by Messrs. Tangye, are preferable to all. They do much duty combined with great compactness. They dispense entirely with the trouble-some rod arrangement, giving often rise to stoppages, so that they will be applied shortly to a great extent, and are already in use in many localities. There is no doubt that this is in every respect practical system will command a general adaptation."

200 SIZES AND COMBINATIONS OF THESE PUMPS ARE NOW MADE.

The following are a few of the Sizes for High Lifts in Mines:—

Diameter of Steam Cylinder .....In.	7	8	9	9	10	10	12	12	12	14	14	14	16	16	16	16	18	18	18	18	21	21	21
Ditto of Water Cylinder .....In.	3	3	3	4	3	4	3	4	5	4	5	6	4	5	6	7	5	6	7	8	5	6	7
Length of stroke.....In.	24	24	24	24	36	24	36	36	36	36	36	36	36	36	36	36	48	36	36	36	48	48	36
Gallons per hour approximate	1830	1830	1830	3250	1830	3250	1830	3250	5070	3250	5070	7330	3250	5070	7330	9750	5070	7330	9750	13,000	5070	7330	9750
Height in feet to which water can be raised with 40 lbs. pressure per sq. in. of steam or compressed air at pump	325	425	540	300	665	375	960	540	345	735	470	330	960	615	426	312	775	540	400	300	1058	740	540

CONTINUED.

Diameter of Steam Cylinder .....In.	21	21	21	24	24	24	24	21	26	26	26	26	26	30	30	30	30	30	32	32	32	32	32
Ditto of Water Cylinder .....In.	8	9	10	6	7	8	9	10	7	8	9	10	12	8	9	10	12	14	8	9	10	12	14
Length of stroke.....In.	36	36	36	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48
Gallons per hour approximate	13,000	16,519	20,000	7330	9750	13,000	16,519	20,000	9750	13,000	16,519	20,000	30,000	13,000	16,519	20,000	30,000	40,000	13,000	16,519	20,000	30,000	40,000
Height in feet to which water can be raised with 40 lbs. pressure per sq. in. of steam or compressed air at pump	413	326	264	960	700	540	427	345	827	633	500	405	282	840	665	540	375	275	960	758	625	426	313

PRICES OF THE ABOVE ON APPLICATION.—FOR SIZES AND PRICES OF PUMPS FOR LOWER LIFTS SEE SEPARATE LIST.

HOLMAN'S PATENT CONDENSER will be found a great acquisition to all kinds of Steam Pumps, as not only is the exhaust steam completely condensed, and the annoyance from same blowing off entirely got rid of, but a vacuum is obtained in the steam cylinder saving from 20 to 50 per cent. in fuel, and increasing to a considerable extent the economy and efficiency of the Pump.

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